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5ª ed

MIM

Accessibility in the Emergency Department to Patient's Medication History

Margarida David

MESTRADO EM
INFORMÁTICA MÉDICA
2º CICLO DE ESTUDOS

OUT|2012

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This Thesis is dedicated to my Family and to Bart for their unconditional support, patience and understanding.

Acknowledgements

The realization of this master's thesis was only possible thanks to the collaboration and contribution, directly or indirectly, from various people and institutions, to whom I would like to express a few words of thanks and deep gratitude.

Foremost, I would like to express my sincere gratefulness to my advisors Prof. Pedro Pereira Rodrigues and Dr. Fernando Rosa for the continuous support of my research, for their guidance, patience, motivation, enthusiasm and immense knowledge.

I would like to thank all the healthcare professionals from the Portuguese Public Hospitals who collaborated in this study. Their opinions and information shared through the questionnaire responses were crucial.

I also would like to thank all the professionals from the public healthcare services in the Netherlands for having accepted the interviews. A special thanks to Bart Wouters, Information officer in Avans University of Applied Sciences, for doing the recruitment of interviewees and for being the interpreter during all the interviews. Also many thanks to Remco Janssens, managing director of the departments ED, Physiotherapy and Pharmacy in Zuwe Hofpoort Ziekenhuis, for being the connective link between the interviewees.

To all my friends who have always been present at this phase of my life and always gave me unconditional support, courage and strength, a very special thanks. Without their friendship this thesis may not have been completed.

I am also very grateful to José Adão for his precious help at the final stage of my study.

Last but not the least; I would like to thank my family: my parents Valdemar and Natália, my brother Luís, my sister Lúcia and my aunt Maria, for the invaluable support and understanding, by the various sacrifices and the constant encouragement to pursue this study. And most of all to my boyfriend Bart Wouters for his love, patience, support and optimism given along the process of this thesis.

Thank you.

Context

The idea for the subject of my Master's thesis came to mind while developing the project for the Medical Informatics discipline in the first year of this master's degree. The essay of this project with the theme" Accessibility to a database with Patient's Medication History: Can Improve the patient's care and safety in the Emergency Department?" aimed to compare systems that provide the access to patient's medications histories in real-time.

This study made me realize that something should be done in Portugal in relation to this matter, since medication errors are a major concern worldwide and, more specifically, in Portugal. Most part of the hospital prescribing errors are attributable to incomplete medication histories when a patient is admitted at the emergency department.

My professional experience as a consultant during 4 years, particularly in the implementation of electronic health records in several emergency departments nationwide, further intensified my interest in this subject.

Abstract

Introduction: Medication errors are a major concern in the Emergency Department in all countries. Most hospital medication prescribing errors are due to incomplete medical histories at the moment a patient is admitted in the ED.

An accurate medication history deepens the knowledge of the drugs that the patient takes or has taken, and prevents duplication of drugs, drug interactions and could even detect drug-related problems. The collected data is often inaccurate once the patient rarely knows the exact names and dosages of their current and recent prescriptions, or even inexistent given lack of responses from the patient.

Many organizations in many countries (e.g. Netherlands) have already begun to redesign their clinical processes to improve the patient's care and safety. One strategy to minimize the possible problems with medication is having electronic access to the patient's medication history through databases from national community pharmacies.

Aim: The aim of this thesis is to assess the importance of having access to patients' medication histories in the Emergency Department in Portuguese public hospitals. Specifically: to gather opinions from the ED physicians of Portuguese public hospitals; collect information from other countries' systems which already allow access to patient's medication history; and recommend possible paths for improvement in Portugal.

Methods: A questionnaire was sent to all the Emergency Departments of the public Portuguese hospitals, to measure the importance of access to patients' medication histories in the reduction of medication errors and inappropriate interventions. To understand the operational aspects of the existing applications in the Netherlands, the researcher interviewed many different public healthcare service professionals in order to accomplish the purpose of getting accurate information from the most important stakeholders on the Electronic Medication Record.

Results: Portuguese physicians that perform functions in the ED always ask about patient's medication history and they consider that is very important to have access to that information. ED physicians strongly agree that the accessibility to patient's medications history bring several benefits regarding the patient's safety. Regarding the information that most physicians think should be able to access in a computer application with the patient's medication history, the

responses included: Posology; Designation of the medicine; Dosage; Date of prescription; Patient name; Pharmaceutical form; Amount of tablets and Number of packages prescribed. Allergies and adverse reactions to medicines should also be included. About the types of medicines, physicians strongly agree that they should access information on medicines subject and not subject to medical prescription.

In the Netherlands, physicians and the pharmacists organized together a system that records the medication used by patients. The access to medication histories through pharmacies is local, or at most regional, and physicians from hospitals can ask patient's medication information to the community pharmacies via fax or e-mail. Patients can ask a medication list to the community pharmacist and regarding the kinds of medications that become available on the medication history of patients, usually it is only the medication prescribed and dispensed by the pharmacist.

Discussion: It is crucial that we have a complete system, with all the medication from the patient: medication prescribed by the physician and dispensed by the pharmacy and medication not subject to medical prescribing, including homeopathic medicines. But even when we have access to the medication dispensed from the community pharmacies (like in the Netherlands) it should always be necessary to check with the patient the current medication. Another possibility is to design lists of medication and making them available to patients. The objective would be, as in the Netherlands, encourage Portuguese patients to bring always the medication list with them, especially when they seek an Emergency Department. It is important to note that, while this study was being developed, in Portugal, the PDS – Plataforma de Dados da Saúde, was also being implemented, which enables healthcare professionals to access prescribed medication history from the last six months. Health professionals have also access to the information recorded by the patient through Users Portal (e.g. medication in use), if the patient has authorized access to that information. Since there is a solution in Portugal that somehow fulfills the objectives of this study, we then recommend the improvement of the application already in current use.

Keywords – Drug Prescriptions; Medication History; Community Pharmacy Services; Medication Errors; Drug Interactions

Resumo

Introdução: Os erros de medicação constituem uma grande preocupação nos Serviços de Urgência em todos os países. A maioria dos erros de medicação é imputável a uma história incompleta da medicação, no momento da admissão do doente nos Serviços de Urgência.

O profissional de saúde efectua o levantamento do historial de medicação do doente, começando por lhe perguntar a medicação que está a tomar actualmente. Situações de confusão com os nomes e doses dos medicamentos são frequentes, assim como a descrição da cor e características do comprimido ou a caixa do mesmo. Para além destas situações, por vezes é impossível realizar esse levantamento do historial de medicação, devido ao estado de saúde do doente.

Uma história precisa de medicação permite ao profissional de saúde um maior conhecimento dos medicamentos que o doente toma ou tenha tomado, evitando a duplicação de medicamentos e interacções medicamentosas.

Muitas organizações, em vários países já começaram a redesenhar o seu processo clínico para melhorar o atendimento do doente e a sua segurança. Uma estratégia para minimizar este problema é ter acesso em tempo real à história de medicação dos doentes, através da ligação com as farmácias.

Objectivo: O objectivo principal do estudo em que se centra esta tese é avaliar a importância do acesso ao historial de medicação dos doentes nos Serviços de Urgência dos Hospitais Públicos Portugueses. Especificamente: recolher opiniões dos médicos que trabalham dos serviços de Urgência desses mesmos hospitais, recolher e tratar dados oriundos de outros países onde já estão implementados os sistemas electrónicos que permitem acesso à informação em causa e, finalmente, recomendar caminhos possíveis para que se possa melhorar o sistema em Portugal.

Métodos: Foi enviado um questionário para todos os Serviços de Urgência dos Hospitais Públicos Portugueses. O objectivo foi aferir a importância percebida pelos médicos para o acesso ao histórico de medicação dos doentes, na diminuição de erros de medicação e de intervenções inapropriadas quando os doentes acorrem ao Serviço de Urgência. Para compreender os aspectos operacionais das aplicações informáticas já existentes na Holanda, foram entrevistados muitos profissionais de diversos sectores e serviços de saúde.

Resultados: Através do questionário foi possível obter a seguinte informação: os médicos do Serviço de Urgência perguntam sempre aos doentes o seu historial de medicação e consideram

que é muito importante ter acesso a este tipo de informação. Os médicos concordam plenamente que o acesso ao histórico de medicação dos doentes trás muitos benefícios, especialmente no que diz respeito à segurança dos doentes. Em relação à informação que deveriam aceder numa aplicação informática com o histórico de medicação dos doentes, os médicos consideraram as seguintes informações: posologia, designação do medicamento, dosagem do medicamento, data da prescrição, nome do doente, forma farmacêutica do medicamento, dimensão da embalagem e número de embalagens prescritas. Alergias e efeitos secundários também deveriam ser incluídos. Relativamente ao tipo de medicamentos, os médicos concordam plenamente deveriam ter acesso à informação sobre todos os medicamentos, sujeitos ou não sujeitos a prescrição médica.

As entrevistas realizadas na Holanda permitiram recolher informação muito importante, tal como: médicos e farmacêuticos, organizaram em conjunto um sistema que permite o acesso ao histórico de medicação dos doentes; o acesso ao histórico de medicação dos doentes através das farmácias é local ou no máximo regional; os médicos nos hospitais, podem perguntar às farmácias locais (da comunidade próxima) sobre a informação de medicamentos dos doentes, via fax ou e-mail; os doentes podem pedir à sua farmácia a sua lista de medicamentos; em relação ao tipo de medicamentos que ficam acessíveis no histórico de medicação dos doentes, por norma é a medicação prescrita pelo médico e dispensada pela farmácia.

Discussão: Sobre o assunto- história da medicação do doente - é crucial que possamos ter um sistema completo, que englobe toda a medicação prescrita ao doente e dispensada pelo farmacêutico, incluindo a não prescrita ou ainda "medicamentos" homeopáticos. Mesmos nos casos em que se tem acesso a toda a informação relativa à história da medicação do doente (como no caso da Holanda), é sempre conveniente confirmar a medicação com o doente. Uma outra recomendação seria de criar listas de medicamentos dos doentes e permitir-lhes (a estes) acesso directo. Assim o objectivo seria de, tal como no sistema holandês, estimular os doentes portugueses a trazer consigo a lista de medicação, em especial quando acorrem ao Serviço de Urgência. É importante referir que aquando da elaboração deste estudo estava a ser desenvolvida em Portugal a PDS - Plataforma de Dados da Saúde, que permite aos profissionais da saúde ter acesso ao histórico da medicação prescrita nos últimos seis meses. Os profissionais da saúde têm também acesso à informação clínica preenchida pelo próprio doente no Portal do Utente (onde podem constar dados como por exemplo a medicação em uso) caso o doente tenha dado acesso a essa informação. Como já existe em Portugal uma solução técnica que de algum modo preenche os objectivos deste estudo, então este estudo também pretende fazer recomendações no sentido de melhorar a aplicação já em funcionamento.

Palavras-Chave – Prescrição de medicamentos; História de Medicação; Serviços de Farmácia Comunitária; Erros de Medicação; Interacções Medicamentosas

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List of Abbreviations

ACSS – Central Administration of the Health System (Administração Central do Sistema de Saúde, I.P.)

CIC – Health Committee on Clinical Information Technology (Comissão para a Informatização Clínica)

CRRNEU – Commission for the Reevaluation of the National Network of Emergency and Urgency (Comissão para a Reavaliação da Rede Nacional de Emergência e Urgência)

ED – Emergency Department

EMD – Electronic Medication Record

EMR – Electronic medical record

EPR – Electronic Patient Record

EPD – Electronic Health Record

GP – General Practitioner

HL7 – Health level 7

INEM – National Institute for Medical Emergencies (Instituto Nacional de Emergência Médica)

INFARMED – National Authority of Medicines and Health Products (Autoridade Nacional do Medicamento e Produtos de Saúde, I.P.)

LSP – Landelijk Schakel Punt (National Switch Point)

NHS – National Health System (Sistema Nacional de Saúde)

NICTIZ - National Information and Communication Technology Institute for Healthcare

PDS – Portuguese Health Record (Plataforma de Dados da Saúde)

RHAs – Regional Health Administrations (Administrações Regionais de Saúde)

RNU – Users National Register (Registo Nacional de Utentes)

SIGIC – System for management of (waiting list) patients waiting for surgery (Sistema Integrado de Gestão de Inscritos para Cirurgia)

SPMS – Shared Services of the Health Ministry (Serviços Partilhados do Ministério da Saúde)

SPSS – Statistical Package for the Social Sciences

URL – Uniform Resource Locator

WDH – Electronic General Practitioner's Record

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Thesis Outline

Chapter 1 Presents a brief introduction to the concept and services provided from the Emergency Department and shows the problem setting and the aim of this study.

Chapter 2 Background shows a brief summary of the current Portuguese scenario and systems in other countries which allows access to patient's medication history. Further shows the principles of questionnaire construction and displays one of the potential modes of analyzing qualitative interviews.

Chapter 3 Exposes the methodology used throughout this study: explain the methods used to carry out the questionnaire in Portuguese Public Hospitals as well as the methodology used for the interviews with professionals from the public healthcare services in the Netherlands.

Chapter 4 Presents the results of the questionnaire applied to the Portuguese Public Hospitals as well as the results of the interviews carried out in the Netherlands.

Chapter 5 Discusses the results from the questionnaire applied to the Portuguese Public Hospitals as well as the results from the interviews carried out in the Netherlands. Moreover present the research limitations during this study, the main findings of this study and the main recommendations for a possible implementation of a project in this context in Portugal (bearing in mind the current scenario in the country).

1. Introduction

This chapter presents an introduction to the concept and the services provided by the Emergency Department and show the problem setting (medication errors and medication histories) and the aim of the study.

1.1. Emergency Department

The Emergency Department (ED) encompasses an essential service to the general population. It provides an episodic care to diagnose and treat a wide variety of patients with injuries and illness, requiring an appropriate and immediate action.

The Emergency Department can use a triage system (e.g. Manchester Triage) to identify patients who require immediate treatment. With this triage is ensured that patients in serious conditions are immediately identified and attended within time it does not endanger their medical condition.

Emergency Department is a complex healthcare service in which healthcare professionals are subject to an intense environment and high pressure, faced with the need to comply with response times. Take quick and effective decisions, often without enough information (e.g., in relation to the patient's medication) is part of the routine of healthcare professionals in ED. (Simonaitis, Belsito, & Overhage, 2008)

In Portugal ED provided services, are often used alternatively to primary care, especially when patients have no family doctor or when he cannot attend them. Another reason is that many patients prefer to go directly to the ED because they may perform all diagnostic tests in a short time. All this causes an increase to the ED visits and consequently an inappropriate use of the services provided, further compounded by the fact that the facility services in most hospitals are too small for such a high number of patients. (EOHSP, 2011) The

large affluence to ED services also provokes the continuing need to reinforce the physician's shifts (often in 24-hour shifts).

The report from European Observatory on Health Systems and Policies of 2011 shows that "Portugal has about 100% more use of emergency departments than in England (accident and emergency units) and about 50% more than in France." (EOHSP, 2011)

Can be registered in Portugal some new policies, with impact on the hospital level and at the level of primary health care, which serve the purpose to decrease this tendency. For example, with the increase in user fees in early 2012 for emergency departments, it was intended to normalize the flow of patients, preventing inappropriate use of these services and providing quality improvement of the services.

Indeed, ED represent an open door to high cost to the (SNS) Sistema Nacional de Saúde – equivalent to NHS, particularly because the ED physicians, through lack of information about the patient, need to conduct a number of complementary means of diagnosis that otherwise (if the patient was attended by their family physician, in possession of his background and clinical data) would be in large part dispensable.

In recent years it was also created the Comissão para a Reavaliação da Rede Nacional de Emergência e Urgência (CRRNEU) – Commission for the Reevaluation of the National Network of Emergency and Urgency, to develop and monitor the reforms in emergency services. Stand out the following proposals and recommendations:

- Recognition that the system Emergency's mission is the care and treatment of emergency situations;
- The Primary Health Care are responsible for the care of other acute situations that are not emergencies and have to ensure accessibility needed to attend these situations;
- Creation of a training plan in Emergency Medicine to Physicians who work in emergency services, in the form of subspecialty or preferably specialty. (CRRNEU, 2012)

1.2. Problem Setting

1.2.1 Medications Errors

Medication errors are a main cause of morbidity and mortality. As an example, one study carried out in United Kingdom showed that around 16% of prescribing errors caused damage to patients and 38 patients died. (FitzGerald, 2009)

Thus reducing medication errors has become a priority in worldwide health systems. The key question is how these errors can be minimized in an attempt to improve patient safety.

In the Emergency Departments (ED) medication errors became also a major concern. Most hospital medication prescribing errors is attributable to incomplete medication histories at the moment a patient is admitted in the ED. (Tam, et al., 2005)

1.2.2 Medication history

The process of keeping a medication history begins when the physician asks the patients (if the patient can respond) what kind of prescribed and non-prescribed medication they are taking. The collected data is often inaccurate because the patient rarely knows the exact names and doses of their current and recent prescriptions, or they just describe the color and characteristics of the pill or medication box. Usually patients bring into ED a bag with medications, containing a mixture of pills, that can be from the patient or not. The label on each medication (if exists) can provide information about the medication that the patient is using because commonly contains the name of the patient, the date of the prescription and the frequency. (Chan, Taylor, Marriott, & Barger, 2009)

An accurate medication history gives more knowledge of the drugs that the patient takes or has taken, and prevents duplication of drugs, drug interactions and could even detect drug-related problems. A good medication history should encompass all currently and recently prescribed drugs, previous adverse drug reactions including hypersensitivity reactions, any over-the counter medications, including herbal or alternative medicines, and adherence to therapy.

1.3 Aim

The aim of this Master's thesis is to assess the importance of having access to patients' medication histories in the Emergency Department in Portuguese public hospitals.

Specifically:

- Gather opinions from the ED physicians of Portuguese public hospitals;
- Collect information from other countries systems which already allow access to patient's medication history;
- Recommend possible paths for improvement in Portugal.

2. Background

This chapter shows an overview of the current Portuguese scenario and a brief summary of other systems in other countries which allows access to patient's medication history. Further shows some research methods: the principles of questionnaire construction and analyzing qualitative interviews.

2.1 An overview of the Scenario in Portugal

At present, the growing complexity of economic and social life brought a change in the structure of organizations, thus became crucial that organizations be more agile, enabling an anticipation of change and finding solutions to meet such changes. In recent years, there have been plenty of changes in relation to the policy of drugs in Portugal.

2.1.1 Non-prescription medicines

The obligation of a prescription always depends on the classification that is assigned to drugs. Thus, we have drugs subject to medical prescription or medicinal products not subject to medical prescription. The drugs subject to medical prescription can only be dispensed by the pharmacy with a medical prescription, or granted by qualified professionals to prescribe medication. One of the reasons why some drugs have requirement of a prescription is that they can be directly or indirectly a risk to patients, especially if they take them without medical surveillance (INFARMED, 2012).

Infarmed – Autoridade Nacional do Medicamento e Produtos de Saúde, I.P. – National Authority of Medicines and Health Products, is responsible for the authorization of medicines on the national market. Furthermore, is responsible for monitoring and ensuring the implementation of all obligations and

procedures that be subject to manufacturers, distributors, prescribers, pharmacies and other points of sale medicines. (INFARMED, 2012)

The liberalization of the sale of medicinal products not subject to medical prescription in 2005, was one of the measures adopted by the Portuguese government. That is, the marketing of the formerly known "non-prescription drugs" started to be commercialized outside pharmacies. However, it required the presence of qualified technicians in their delivery to the public. This regime provides benefits for consumers since it increased the number of medicines points of sale and allowing more accessibility. (Ministério da Saúde, 2005)

2.1.2 The Electronic Prescription

The Electronic Prescription is the procedure for issuing prescriptions through computer applications certified by the ACSS – Administração Central do Sistema de Saúde, I.P. – Central Administration of the Health System. (Ministério da Saúde, 2012)

With the introduction of the Electronic Prescription, the Portuguese government sought to stimulate the health system informatization. At same time a better communication between professionals from different institutions, since there is a standardization of the format of the information that is exchanged. Reducing the risk of errors in prescriptions was another goal. This policy also had the objective of controlling the entire circuit of the medicinal products and consequently reduction of fraud. (Ministério da Saúde, 2011)

The electronic prescription of drugs took effect on 1 August 2011. The electronic prescription applies to all medicinal products subject to medical prescription, but can also be used for prescription medications not reimbursed. (Portal da Saúde, 2012)

After the introduction of electronic prescription users who go to a pharmacy with a prescription written by hand lose the drug reimbursement from the government. Unless prescribers are framed within the exceptions of the ordinance that regulates the electronic prescription: cases of unsuitability of the prescribing information, system failure or lack of access to the computer system, reduced doctor's prescription (less than or equal to 50 prescriptions per month) or carried out in the patient's home. (Ministério da Saúde, 2011)

2.1.3 Portuguese Health Record (PDS)

The Plataforma de Dados da Saúde (PDS) - Portuguese Health Record, was developed by the Comissão para a Informatização Clínica (CIC) – Health Committee on Clinical Information Technology and the Serviços Partilhados do Ministério da Saúde (SPMS) – Shared Services of the Health Ministry, and operates as national registry allowing healthcare professionals to access relevant clinical information from patients anywhere in the country. (Portal da Saúde, 2012)

With the PDS the healthcare professionals from the Sistema Nacional de Saúde (SNS) – equivalent to NHS - can access patient's clinical data that until now were dispersed in different information systems. The data that are available in the PDS remain located in their various original institutions spread over Portugal. The platform is confined to consult the different systems for delivering health information to healthcare professionals. The access to PDS is restricted and audited, being possible knowing who and when patient's clinical information was consulted once the access it is registered. For example, the PDS allows the heath professional of the hospital accessing some clinical data from the Health Center without be able to change or damage. (i-GOV, 2012)

Through the PDS, professionals in hospitals and primary care will now be able to view information from NHS institutions, the historical records of the Instituto Nacional de Emergência Médica (INEM) – National Institute of Medical Emergency, the historical records of the Plano Nacional de Saúde Oral – National Oral Health Plan, the patient's prescriptions history and the data that patient's has entered in the Portal do Utente – Citizen Portal, depending if they have given permission to view, like contacts in an emergency situation or the medication in use. Also supplementary diagnostic performed in hospitals and primary health care, which are electronically stored in various information systems, should be progressively accessible through PDS to healthcare professionals who provide care in polyclinic, internment or emergency. (i-GOV, 2012)

A huge variety of data about the patient begins to be accessible to healthcare professionals by a unique platform. But this is an access that, nationally, is being made available through various phases.

The PDS provides clinical information through different portals to different stakeholders: Portal do Utente (Citizen Portal); Portal do Profissional (Health professional Portal) and Portal Internacional (International Portal). (Portal da Saúde, 2012)

a) Citizen Portal

The Citizen Portal became operational in early May 2012 and allows citizens to fill in their health records and utilize several online services. The user has a reserved area for entering their data where can register emergency contacts, health data, habits, medication in use, allergies, illnesses, etc. The entire clinical information will be accessible throughout the country if the patient agreed to share their data with the SNS by default. This information will be accessible in the Citizen Portal by two different ways: a) information entered by the user or b) clinical information entered in various different information systems of the National Health Service.

When the patient does not intent that clinical information should be shared then he should consult the website and state that he does not agree. It should be noted that the intention of sharing or not sharing clinical information expires after 12 months. (Ministério da Saúde, 2012)

In the Citizen Portal, the user will also have access to "eAgenda", a service that allows scheduling appointments with the GP and request chronic prescription; the "eRNU" – Registo Nacional de Utentes – Citizen National Register, which allows accessing the user data registration (e.g. identification, address, etc..) and the "eSIGIC" – Sistema Integrado de Gestão de Inscritos para Cirurgia –Integrated Management System for Surgery Subscribers, which allows to consult information regarding registration for surgery. (Ministério da Saúde, 2012)

- **Registration of medication in use**

The user (citizen) can enter data about his medication in use or previously used, prescribed or not prescribed by a physician.

The user has the following fields available: a) active substance title for each medication; b) if currently his taking the medication; c) date of initiation of dosing; d) time of dosage of the medication; e) pharmaceutical form (e.g. oral); f) duration (e.g. less than 3 days); g) recurrence (e.g. daily); h) daily frequency (e.g. 1 per day) and i) reason why his taking that medication.

The user can also edit the input data as well as delete the entered data. It has still available the option to export this data as a calendar to Outlook or Google Calendar. After fill in the therapy grid the user can print it. (Ministério da Saúde, 2012)

b) Health Professional Portal

In the first phase, which coincided with the official launch in Porto, the PDS became accessible to institutions and health professionals under the coordination of Administração Regional de Saúde do Norte (ARS Norte) – North Regional Health Administration. Throughout this year the use of platform will be extending to other regions and ARS's of the country. (i-GOV, 2012)

The access to the Professional Portal is made from the information system of the institution (e.g. SAM – Sistema de Apoio ao Médico) where the healthcare professional is working. To access the platform, the physician should have an open session from the patient. Thus, selecting the icon of PDS, is opened a session in the professional portal that will focus on that patient.

In this portal the health professional has access to various functionalities, including: map (area of connection between the systems of the various institutions of the country); timeline (perspective chronological of the patient episodes); Citizen Portal (Consultation of information entered by the user, but only if it has been authorized in advance by itself); oral health (a summary of oral health) and also the history of prescriptions.

• Prescription history

In the prescriptions history menu the healthcare professional can view the history of prescriptions issued in the last six months. The history of prescriptions is composed of several prescriptions emitted to the patient. In this menu the healthcare professional has access to the following information: (Healthcare Professional, 2012)

- Information that identifies the prescription (date; recipe number unique, recipe state and renewal number of recipes);
- Prescription details (name of the physician who prescribed the medications and location of the prescription)
- Details of prescribed medications (active substance (e.g. Pantoprazole); prescribed dosage (e.g. 40 mg); pharmaceutical form (e.g. pills), tablets (e.g. 60 units) and amount of tablets (e.g. 1 unit)).

2.2 Scenarios in other countries

Many organizations in many countries have already begun to redesign their clinical processes to improve the patient's care and safety. One strategy to minimize the possible problems with medication errors is having electronic access to patient's medication history, through databases from national community pharmacies. In this way, physicians have knowledge about what, when and how much medication was dispensed from the pharmacy to the patient.

In the Figure 1 is shown a few examples of countries that already allow access to patient's medication history.

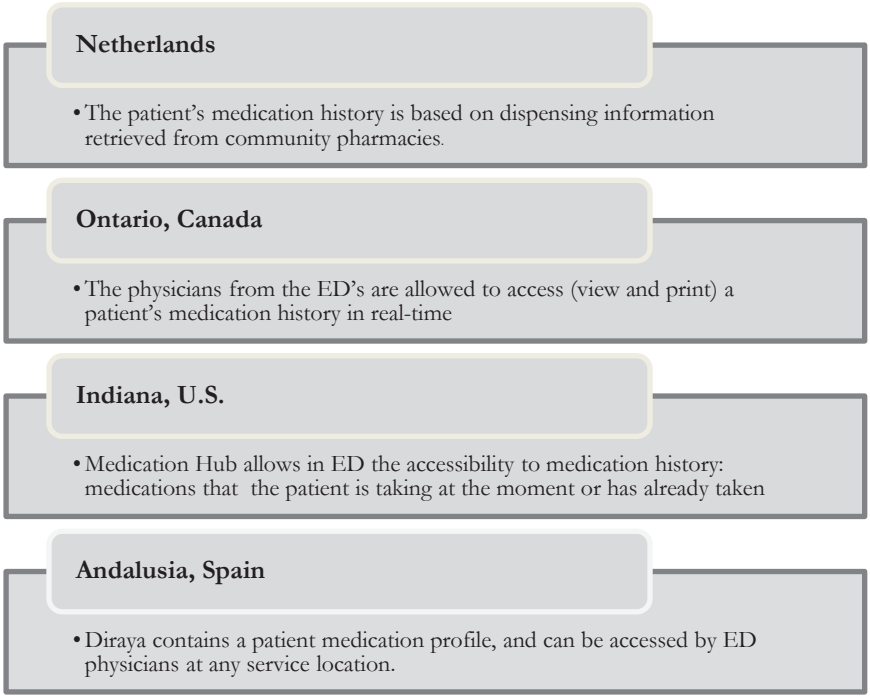

Figure 1 – Examples of countries which allow the accessibility to patient's medication history

- **Netherlands**

The Dutch health care system is considered to be pioneer in the transition to electronic medical records along with other developed countries such as Denmark, Australia or New Zeeland. (Barjis, 2010)

Back in 1972, the Netherlands tried to build an integrated health system. Their first project was conducted at University Hospital Leiden in order to develop an integrated Hospital Information System. Since 1985 most of the general practitioners had been using an information system in their offices. (Barjis, 2010)

The use of EMR's is quite high in the Netherlands; however there are still several challenges ahead in order to build an integrated healthcare information system.

In recent years the Ministry of Health together with NICTIZ, the national IT institute for healthcare in the Netherlands, is developing a nationwide system – the National Switch Point (LSP – Landelijk Schakel Punt), that provides the electronic exchange of medical data to qualified professionals throughout the country. (NICTIZ, 2008)The implementation of the Electronic Health Record (EPD) is being developed in several stages. Initially the aim is that an Electronic Medication Record (EMD) and an Electronic General Practitioner's Record (WDH) will be introduced. (Barjis, 2010)

There are certain aspects that facilitate the implementation of this project, such as the existing regional electronic exchange, the communication facilities between General Practitioners and pharmacists, and the fact that most part of the practitioners presently use EHR's in their practice. Therefore, the future objective of NICTIZ is to connect all practices to the central database. (Department of Health Policy, 2009) For privacy reasons this project was canceled in November 2011.

At present, the Ministry of Health has transferred the LSP to a separate organization called Vereniging van Zorgaanbieders voor Zorgcommunicatie (VZVZ) - Association of Healthcare providers for Healthcare Communications. In November 2012 the VZVZ will start a campaign towards patients to ask their permission to include their data in the LSP. They are going to inform how patients may authorize the provision of their medical records and ask them to fill in a form (at their doctor, pharmacy, or online). The objective is that patients allow their information to be accessible for all healthcare professionals in the Netherlands. If patients don't give authorization until January 1, 2013, their data are not including on the LSP (but patients may also authorize after that). (VZVZ, 2012)

- **Ontario, Canada**

In Ontario, one of the provinces of Canada, the Ministry of Health and Long-Term Care provided most Ontario hospital ED's with electronic access to the medication history of patients, through the Ontario Drug Benefit program (ODB). The electronic records of dispensing medications carried out in pharmacies are the source for the medication history. (Paterson , Suleiman, Hux, & Bell, 2008)

The physicians from the ED's are allowed to access a patient's medication history in real-time. The major objective of this system is to help healthcare providers to quickly identify and prevent drug reactions, and provide more informed emergency care. Physicians who work in emergency when access this information can make a faster diagnosis and prognosis. (Paterson , Suleiman, Hux, & Bell, 2008)

- **Indiana, U.S.**

In Indiana, the **Regenstrief Medication Hub** aggregates data from the RxHub, a consortium of pharmacy benefit managers. The main objective of the Medication Hub is the availability of medication history. With this information the ED health professionals know what kind of medication the patient is taking at the moment or has already taken. (Simonaitis, Belsito, & Overhage, 2008)

- **Andalusia, Spain**

The **Diraya system** (Historia Clínica Digital del Ciudadano, or Citizen's Digital Medical Record) allows healthcare professionals to access to a database for the region of Andalusia. (Suárez-Varela, Beltrán Calvo, Molina López, & Navarro Marín, 2005)

Diraya took advantage of the fact that some physicians were already using computer-aided system for prescriptions, the Receta XXI. Furthermore, the Receta XXI is an electronic prescription system that connects the doctor's office and the pharmacy. Diraya supports e-prescribing (Receta XXI) and the dispensing of medications. (Protti, 2007)

Diraya contains a medication profile (medications prescribed and dispensed to patients), and can be accessed by physicians at any service location. The emergency care professionals can view patient's information about the current and past medications in Diraya's medication record. (Suárez-Varela, Beltrán Calvo, Molina López, & Navarro Marín, 2005)

2.3 Research Methods

2.3.1 Principles of questionnaire construction

There is a large variety of ranges and types of questions that can be used in developing a questionnaire. Depending on the choice of these, the data collection and analyses will be affected.

In the construction of a questionnaire might be used open questions, closed questions or both. Open questions allow respondents to expand their answers and give more and rich information to the researcher. On the other hand, requires that the researcher is prepared to analyze the amount of information which is sometimes excessive. (Rattray & Jones, 2007) The use of closed questions allows respondents to choose from a limited number of responses established by the researcher. Thus the researcher can synthesize the data results in a faster and easier way. (Boynton & Greenhalgh, 2004)

Along the questionnaire the researcher can utilize multiple-choice questions (with two or more answer options) allowing the respondents to choose: a) one of two answer choices, b) choose one of many answer choices or c) choose many alternatives.

In addition to the multiple choice questions the researcher also can resort to scales. The *Lickert* scale is one of the most widely used and since it is composed of fixed format responses, allows measuring the attitudes and opinions from the participants. (Boynton & Greenhalgh, 2004) The *Likert* scale is used to measure the levels of agreement or disagreement of the respondents. For each statement, the respondent is asked whether, and how strongly, they agree or disagree. A frequency scale can also be used in the construction of a questionnaire. With this type of scale it is possible to measure the frequency of behavior (how frequently the respondents execute certain actions). Another scale that is often used is the importance scale. This one measures the level of importance that respondents give a particular subject.

2.3.2 Analysing qualitative interviews

The qualitative research involves the collection, analysis and interpretation of data, which can be collected from interviews, observations, focus groups and others.

There are several analysis procedures that have been developed in the last years in the qualitative research area. A qualitative analysis can be performed according the approaches of the following authors.

Berkowitz's supports that when the analyst is making a qualitative analysis of data, he must keep in mind a list of questions that he must constantly try to answer. (Berkowitz, 1997)

The Table 1 shows the list of questions that the analyst should be "asking and reasking"

Table 1 - List of questions (Berkowitz, 1997)

Questions
• What patterns and common themes emerge in responses dealing with specific items? How do these patterns (or lack thereof) help to illuminate the broader study question(s)?
• Are there any deviations from these patterns? If yes, are there any factors that might explain these atypical responses?
• What interesting stories emerge from the responses? How can these stories help to illuminate the broader study question(s)?
• Do any of these patterns or findings suggest that additional data may need to be collected? Do any of the study questions need to be revised?
• Do the patterns that emerge corroborate the findings of any corresponding qualitative analyses that have been conducted? If not, what might explain these discrepancies?

The processes that Berkowitz presents for the analysis of qualitative data are based on the framework developed by Miles and Huberman (1994): data reduction, data display, and conclusion drawing and verification. (Miles & Huberman, 1994)

Figure 2 - Phases of qualitative data analysis (Miles & Huberman, 1994)

Miles and Huberman (1994) state that, "Data reduction refers to the process of selecting, focusing, simplifying, abstracting, and transforming the data that appear in written up field notes or transcriptions." (Miles & Huberman, 1994)

Data display is the next step in Miles and Huberman's (1994) model of qualitative data analysis. The data provides "an organized, compressed assembly of information that permits conclusion drawing..." (Miles & Huberman, 1994)

Conclusion drawing and Verification is the final step of qualitative analysis. According to Miles and Huberman's (1994): "The meanings emerging from the data have to be tested for their plausibility, their sturdiness, their 'confirmability' - that is, their validity". (Miles & Huberman, 1994).

3. Methods

In this chapter will be presented the methodology used in the developed study. Will be explained the methods used to carry out the questionnaire in Portuguese Public Hospitals as well as the methodology used for the interviews in the Netherlands. For that reason this chapter has been divided into two sections: Questionnaire and Interviews in the Netherlands.

3.1 Questionnaire to ED physicians

3.1.1 Objective

In order to measure the importance of access to patient's medication histories in the reduction of medication errors and inappropriate interventions, has been constructed a structured questionnaire for physicians who work in the Emergency Departments of the Portuguese Public Hospitals.

This questionnaire also aimed to figure out what kind of information about medication is considered more important for physicians and if it should be accessible in real time.

3.1.2 Participants

The target population of this questionnaire was the Emergency Departments of public hospitals in Portugal. It was addressed to the emergency medical staff: general practitioners and medical specialists, including medical interns (also called first-year residents) and junior and senior residents. In total the questionnaire was sent to 41 Hospitals (n=41).

In the present study were considered only the Portuguese hospitals where Emergency Departments exist. The list of the Portuguese hospitals considered, is shown in the Table 2 and also in the Appendix I in more detail.

Table 2 - List of Portuguese public hospitals based on the distribution of Regional Health Administrations - RHAs (Ministério da Saúde, 2012)

Region	Portuguese public hospitals
North	Unidade Local de Saúde de Matosinhos
	Centro Hospitalar de São João
	Unidade Local de Saúde do Nordeste
	Centro Hospitalar de Trás-os-Montes e Alto Douro
	Centro Hospitalar do Alto Ave
	Unidade Local de Saúde do Alto Minho
	Centro Hospitalar do Porto
	Centro Hospitalar de Vila Nova de Gaia/Espinho
	Centro Hospitalar do Tâmega e Sousa
	Hospital Santa Maria Maior (Barcelos)
	Centro Hospitalar do Médio Ave
	Centro Hospitalar Póvoa de Varzim-Vila do Conde
	Hospital Braga
Center	Hospital Infante D. Pedro
	Hospital Distrital de Águeda
	Hospital Distrital da Figueira da Foz
	Centro Hospitalar Cova da Beira
	Centro Hospitalar de Entre o Douro e Vouga
	Centro Hospitalar Leiria-Pombal
	Centro Hospitalar Tondela-Viseu
	Centro Hospitalar e Universitário de Coimbra
	Unidade Local de Saúde de Castelo Branco
	Unidade Local de Saúde da Guarda
Lisboa and Vale do Tejo	Hospital Prof. Doutor Fernando Fonseca
	Centro Hospitalar de Lisboa Central
	Centro Hospitalar de Lisboa Ocidental
	Centro Hospitalar Lisboa Norte
	Centro Hospitalar do Médio Tejo
	Hospital Garcia de Orta
	Centro Hospitalar Barreiro Montijo
	Hospital Distrital de Santarém
	Centro Hospitalar de Setúbal
	Centro Hospitalar do Oeste Norte
	Hospital de Reynaldo dos Santos
	Hospital Beatriz Ângelo
Alentejo	Unidade Local de Saúde do Baixo Alentejo
	Unidade Local de Saúde do Norte Alentejano
	Hospital do Espírito Santo de Évora
	Hospital do Litoral Alentejano
Algarve	Centro Hospitalar do Barlavento Algarvio
	Hospital de Faro
Total (n=41)	

3.1.3 Recruitment

During the period from December 2011 to July 2012, all Portuguese Public Hospitals were contacted about this survey. The first contact established with hospitals, was by phone and with the Board of Directors secretary. The purpose of this contact was to explain the subject of the research and ask for clarifications about the procedures to obtaining approval from the Board of Directors.

According to the information provided, a formal requirement for authorization was sent addressed to the Board of Director of the hospital, via e-mail or by registered mail (see in Appendix II). The request letter which was sent referred aims and subject of the study and explained the way the researcher wanted to proceed on his research: the method that would be used – a questionnaire; to whom it was addressed and how the questionnaire should be delivered.

Thus the researcher requested:

- That the questionnaire should be available to all physicians from the emergency department;
- The questionnaire should be send via online from the internal services from the hospital, sending the URL to the e-mail addresses of the physicians;
- Allow the researcher to know the total number of professionals who had access to the questionnaire.

In the request letter the researcher also informed that all data would be treated anonymously and at the end of the study would be sent a summary of the results obtained, and personal emails were never requested.

Since was requested that the questionnaire was made available online (via e-mail) through the hospital services, the researcher found it convenient to prepare a short text that would be sent together with the survey URL. This text aimed to explain the subject of the research; to provide guidance to fill in the questionnaire and to thank the cooperation of the physicians. It was also mentioned that the data would be treated anonymously and that the questionnaire had been approved by competent authorities of the hospital.

In addition to the request letter, was sent the questionnaire in PDF format (see in Appendix III); a declaration stating of the Master Studies attendance and the Thesis Proposal.

Upon submission of all documentation required, a few days later, contact has been made once again by telephone, to confirm the reception of the documents and to understand if any further information should be provided.

The researcher received written permission (via e-mail or letter) by the Board of the Hospital to conduct the questionnaire. Afterwards the researcher had to reestablish contact with the hospital to thank the cooperation and to clarify any questions. It was also confirmed the URL of the questionnaire matching the hospital, resubmitted by email.

In some hospitals in the northern region of Portugal, the researcher has been in person at the Emergency Department. Therefore was possible to explain to physicians the purpose of the study and motivating them to reply the questionnaire.

3.1.4 Questionnaire Development

The construction and development of a questionnaire followed a logical, systematic and structured approach. The researcher produced a structured questionnaire in Portuguese language (see in Appendix III). At the beginning the researcher identified himself and explained the subject and the purpose of the study. The time it would take to answer the questionnaire has also been mentioned. By the end the researcher thanked the collaboration and participation from participants and indicated how they should save the data and exit the questionnaire.

The questionnaire is composed of thirteen questions (each question is numbered), split into two sections: Personal and Professional Information and Expertise and Opinion.

In the Table 3 researcher presents all the questions from the questionnaire as well as the objective for each question.

Table 3 – Questions

Section	Question	Objectives
I - Personal and Professional Information	1. Gender 2. Age 3. Medical training level 4. Medical specialty 5. Institutions where you work besides ED 6. Please mention the number of work hours per month at ED	Collect personal and professional data from the participants.
II - Expertise and Opinion	7. In an emergency situation how often you seek for patient's medication history medication history in the ED	Identify how often the physicians in ED seek for patient's medication history.
	8. Discussion about the importance of accessibility to medication history in the ED	Know the level of importance of accessibility to medication history in ED.
	9. Your opinion about benefits with the access to medication history in the ED	Measure the levels of agreement or disagreement regarding benefits with access to medication history in ED.
	10. In a computer application which information you think should be accessible regard to patient's medication history?	Identify information's that should be accessible regard patient's medication history.
	11. What kind of medications (prescribed and non-prescribed) you think should be included in the computer application	Know the types of medications that should be included in the computer application.
	12. Other information that should be included in the computer application	Identify other important information to include in the computer application.
	13. Comments	Other information that the participants considered relevant regard this subject.

Section I aimed to collect personal and professional data from the participants of the questionnaire. In section II the purpose was to measure the importance of access to patient's medication history in the Emergency Department as well as the type of information that should be accessible in real time.

The majority of the questionnaire contained closed questions allowing respondents to choose from a limited number of responses.

Along the questionnaire the researcher has used multiple-choice questions and scales. In the Table 4 Is shown the types of scales used throughout the questionnaire.

Table 4 - Types of response scales

Type of response scale	Example
Agreement	1. Strongly Disagree 2. Disagree 3. Neutral 4. Agree 5. Strongly Agree
Frequency	1. Always 2. Often 3. Sometimes 4. Rarely 5. Never
Importance	1. Irrelevant 2. Not so important 3. Important 4. Very important 5. Determinant

In the multiple choices questions the respondent always had an option for "other" to be filled in, if necessary.

Only the last question in the questionnaire was open, allowing the respondent to write specific information that he thought relevant to the study.

The questionnaire was developed in a way that the answers were not mandatory. Thus the respondents had the freedom to answer only the questions they wanted.

3.1.5 Data collection methods

To conduct the questionnaire the web-based survey *MedQuest* was used. This application is based on web technologies, intended for the operation of online questionnaires in health. (Gomes, 2009)

Using Web-based surveys has various benefits over conventional paper questionnaire. Once the data is collected electronically the researcher has immediate access to the answers given to the questionnaire. It also enables a faster and cheaper analysis of data. (Wyatt, 2010)

After building the questionnaire was then needed to create the URL (Uniform Resource Locator). To each hospital that was part of the sample was created a specific URL. Thus the researcher would know immediately which hospital was replying to the questionnaire (the researcher had no access to respondent identification, only had access to the group number attributed to the hospital).

3.1.6 Statistical Analysis

The data collected from the questionnaires was collected on July 31, 2012.

Through the Export module of *MedQuest* was possible to export all the data into *IBM® SPSS® (*version 19) for subsequent statistical analysis.

The data collected have been cleaned by removing the data from tests, only maintaining the data related to the questionnaires answered by the participating hospitals in this research.

In statistical analyses of data were used specific tests, starting with a descriptive analysis followed by performing tests to find out if there were relevant differences between responses: Mann-Whitney U test (to compare differences between two independent groups) and Pearson Chi-square (to discover if there was a relationship between two categorical variables). Was also calculated a summary measure such as the median.

The variables considered for the statistical analyses were the following:

1. Gender
2. Age
3. Medical training level
4. Medical specialty
5. Institutions where you work besides ED
6. Please mention the number of work hours per month at ED
7. In an emergency situation how often you seek for patient's medication history medication history in the ED
8. Discussion about the importance of accessibility to medication history in the ED
9. Your opinion about benefits with the access to medication history in the ED

10. In a computer application which information you think should be accessible regard to patient's medication history?
11. What kind of medications (prescribed and non-prescribed) you think should be included in the computer application
12. Other information that should be included in the computer application
13. Comments (other information considered relevant)

3.2 Interviews in the Netherlands

3.2.1 Objective

To understand the operational aspects of the existing applications in the Netherlands, the researcher interviewed many different professionals from the public healthcare services. The purpose was to talk with all the stakeholders which could be important to accomplish one of the most important aspects, the Electronic Medication Record.

3.2.2 Participants

The researcher conducted seven face-to-face interviews; all of them in the English language. Whenever necessary the researcher worked with the assistance of the interpreter – Bart Wouters.

All the interviews were tape-recorded with the authorization of the interviewees and the interpreter. If such authorization was not granted by all interviewees the data collection have been made using the method of writing.

The Table 5 comprises all the interviews from the Netherlands.

Table 5 - Interviews in the Netherlands

Date	Name	Function	Hospital/Institution	Region
Nov 7, 2011	Dr. A. R. Hulsmann Dr. Marc Jonkers	Pediatric Pediatric	Amphia Ziekenhuis	Breda
Nov 7, 2011	Dr. Relin Verzijl	Hospital Pharmacist	Amphia Ziekenhuis	Breda
Nov 7, 2011	Dr. Renier van Dinter	NBD Manager	Janssen-Cilag B.V.	Tilburg
Nov 7, 2011	Dr Gert-Jan Schassfoort	Family Physician	Huisartsenpraktijk Markt	Etten-Leur
Nov 8, 2011	Dr. Rob Kuiper	Hospital Pharmacist	Zuwe Hofpoort Ziekenhuis	Woerden
Nov 8, 2011	Dr. M. Stammers	Local Pharmacist	LLOYDS Apotheek	Etten-Leur
Nov 9, 2011	Dr. Lily Heijnen	Program Manager	Amphia Ziekenhuis	Breda

3.2.3 Recruitment

The researcher was able to interview a variety of professionals from the public healthcare service in the Netherlands due to the contacts of Bart Wouters, which was the interpreter at all times. The objective was to talk with all the stakeholders witch could be important for the study of the electronic medication record. The researcher has managed to talk with all the stakeholders she intended to; with the exception of an Emergency Department Director.

The recruitment of interviewees was made by Bart Wouters. The researcher explained to Bart which kind of professionals would like to interview for the research. Through his personal connections Bart found the right professionals and was the person who made the first contact by telephone to ask these professionals if they liked to participate in an interview. Later on he was also the interpreter during the interviews.

After accepting the interview and setting a date and time, the interviewees received an email to confirm the interview.

Two weeks before the interview an e-mail was sent explaining the subject and the objective of the study. That email included also an interview guide and an academic article with the theme "Accessibility in the Emergency Department to patient's medication history". This article was written for the 4th Medical Informatic's Symposium, in October 2011, Faculty of Science, University of Porto. (See in Appendix IV).

3.2.4 Interviews

The data collection method was comprehensive and detailed and was done through face-to-face interviews. It was used a combination of open-ended and closed-ended questions during the interviews, for which has been used a pre-prepared interview guide.

The structured interview guide included keywords to help the interviewees, the interpreter and the researcher to combine the two types of questions. With this method the researcher gained a bigger amount of information and more clarification (See in Appendix V).

The purpose of sending the interview guide to the interviewees in advance was for them to be prepared and know exactly the content of the interview. It was also very important during the interview because it facilitated a logical order of the interview with not to many deviations.

All the interviews were face-to-face which allowed the researcher to further clarify and even adjust the questions as needed. The questions were repeated or reformulated when necessary. Like this the researcher could also be certain that the questions as well as the responses were correctly understood. The interviews were conducted in an informal way. Sometimes the order of the questions was changed during the course of the interview due to the professional interests of the interviewee. While the interview was recorded on audio support, some notes were being taken by the interviewer.

The interviews took place in the interviewee workplace or in the boardroom of his department and lasted on average one hour. At the beginning of each interview, the researcher always explained the subject and the aim of the study as well why the choice of the interviews in the Netherlands. Has also been asked what the role of the interviewee in the hospital or institution was.

The existence of an interpreter was vital, as sometimes the Dutch language was used when the interviewee could not clearly explain his point of view. The interpreter was properly prepared for the interview and knew exactly what was intended. He was also allowed to ask questions when needed.

3.2.5 Qualitative analyses

The data collection has been based on qualitative methodology such as interviews. The data from the interviews consists of direct explanations from the interviewees about their views, practices and knowledge.

The first step of this process was to make a transcript of the audio taped interviews. (See in Appendix VI)Thereafter the transcribed text was compared again with the recording. By this way the last mistakes and repetitions could be corrected. Some subjects mentioned in the interviews, particularly the software terms which are used in the Netherlands, had to be confirmed by using the internet and by consulting the interviewees.

Next the transcription of the interview was send to all the interviewed. The researcher sent an e-mail thanking their collaboration and asking if they could read the transcript of the interview, and if necessary, correct or add any relevant information. The Question List was also sent again.

The analysis of the interview transcripts was based on an oriented approach to identify themes, categories, patterns, and relationships in collected data. In the transcript of the interviews was taken into account issues such as overlaps, contradictions, recurrences, concordances, discrepancies and emphases.

The researcher followed the approach of Miles and Huberman (1994) presented in the chapter Analysing qualitative interviews.

- To organize the data collected from the interviews, and in an attempt to reduce the vast amount of the data, only the relevant information for the study in question has been taken into account. Has been especially focused on the list of questions that accompanied all the interviews.
- In this step patterns and interrelations were identified. The data was organized according to themes – answers to the question list and other findings related with the question. The researcher had attention for all the data which occurred: overlaps, contradictions, recurrences, concordances and discrepancies.

The data were summarized and the findings were interpreted and synthesized. For the verification and confirmation of the preliminary conclusions from the interviewees were asked for their feedback. It was also asked to explain the current situation in the Netherlands, specially the progress of the implementation of electronic prescribing and about LSP – the National Switch Point (See in Appendix VII).

4. Results

This chapter presents the results of the questionnaire applied to the Portuguese Public Hospitals as well as the results of the interviews carried out in the Netherlands. For that reason this chapter has been divided into two sections: Questionnaire and Interviews in the Netherlands.

4.1 Questionnaire

The responses to the questionnaire were collected on July 31, 2012 totaling 83 answers (n=83).

The initial sample was composed by 41 hospitals, of which: 14 hospitals authorized the release of the questionnaire; 1 hospital did not authorized; 1 hospital authorized the disclosure but outside the deadline and 25 did not give an answer to the researcher within the time limit for the realization of the study. Thus, the final sample was composed by 14 hospitals. The sample is schematized in Figure 3.

Fourteen (14) hospitals authorized the release of the questionnaire; however, the researcher did not receive responses regarding some hospitals. The main reasons for the lack of response by some hospitals were:

- Not all physicians had personal or institutional e-mail, therefore the questionnaire URL was available on the computers in the doctors' room in the ED;
- After approval from the Board of the Hospital, sometimes was asked to the researcher to contact the Director of the Emergency Department to explain the procedures to follow in the release of the questionnaire. That was not possible, even after several attempts by the researcher;

- Other hospitals requiring the physical presence of the researcher, which was not possible for him due to the geographic distribution of those in the country.

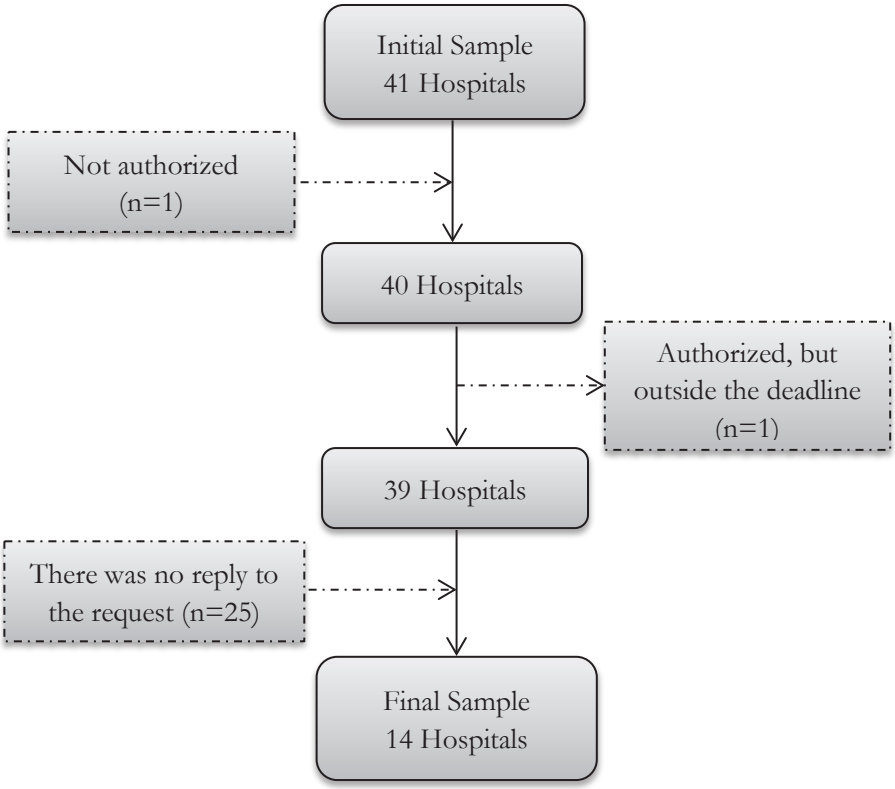

Figure 3 - Schematic illustration of the sample

The researcher also encountered a problem while receiving the survey responses, in particular the respondent wasn't identified (the group number that corresponds to a hospital is not visible). For one reason nonspecific the URL sent to a hospital did not specify what it should.

In the Table 6 might see the name of the hospitals and their corresponding answers (See in Appendix VIII the complete list of the hospitals that authorized the questionnaire and their respective number of answers).

Table 6 - Number of answers by Hospital

Group number	Name of the Hospital	Total of answers
101	Unidade Local de Saúde de Matosinhos (Hospital Pedro Hispano)	28
108	Centro Hospitalar de Trás-os-Montes e Alto Douro (Vila Real)	16
113	Centro Hospitalar de Vila Nova de Gaia/Espinho	15
120	Centro Hospitalar Leiria-Pombal	8
133	Centro Hospitalar do Oeste Norte (Caldas da Rainha)	5
103	Centro Hospitalar do Barlavento Algarvio (Portimão)	3
123	Unidade Local de Saúde de Castelo Branco	1
109	Centro Hospitalar Cova da Beira (Covilhã)	0
105	Hospital Distrital da Figueira da Foz	0
138	Hospital de Faro	0
150	Centro Hospitalar do Tâmega e Sousa (Penafiel)	0
106	Centro hospitalar de São João	0
111	Unidade Local de Saúde do Alto Minho (Viana do Castelo)	0
104	Hospital Infante D. Pedro (Aveiro)	0
Not identified		7*
Total: 14		**n=83**

* For one reason nonspecific the URL sent to one or more hospitals did not specify what it should. It is also possible that some respondents in an attempt to access the questionnaire have copied only part of the URL. If the URL does not contain the information that corresponds to the group, it is impossible to identify the respondent.

4.1.1 Sample Description

Of the 83 participants in the study, 52 (63%) were specialists, while the remaining 31 (37%) were residents, of which 6 (19%) were first-year residents. In the following, two groups will be analyzed separately and compared: specialists and residents.

General information regarding personal and professional information of the participants is showing in Table 7**.** The proportion of gender in both groups was significantly different ($p=0.019$). Likewise, and as expected, the age distribution was also different ($p<0.001$), with specialists being older than residents (linear-by-linear $p<0.001$).

With regard to medical specialties can be seen that the following stand out: General and Family Medicine in total 27%, followed by Internal Medicine

(20%) and Surgery (19%). Further we find that as the value of Pearson's chi-squared test is not significant ($p = 0.777$) this means that there are not statistically differences between the groups.

It was also found that the majority of physicians (residents and specialists) are working in a public hospital (66%) with a workload exceeding 21 hours per month (75%).

With respect to the institutions where the participant work besides the ED, it is found that the value of Pearson's chi-squared test is not significant ($p=0.297$), meaning that there are not differences statistically significant.

Regarding the number of hours that participants work in ED it is found that the value of Pearson's chi-squared test is 0.054.It is concluded that for a significance level of 0.05 does not reject the hypothesis of equal distribution of the two groups (residents and specialists) in the three categories of working hours ($\leq$ 10 hours; 11 – 20 hours; > 21 hours).

Table 7 - Questionnaire responses split by Residents and Specialists.

Results, n (%)	Residents	Specialists	p-value	Total
Medical Career	31 (37)	52 (63)		83 (100)
Gender, n (%)				
Male	14 (45)	37 (71)	0.019*	51 (61)
Female	17 (55)	15 (29)		32 (39)
Age, n (%)				
≤ 30 years	20 (65)	0 (0)		20 (24)
31 - 40	10 (32)	13 (25)		23 (28)
41 - 50	0 (0)	22 (42)	<0.001+	22 (27)
51 - 60	0 (0)	13 (25)		13 (16)
> 61 years	1 (3)	4 (8)		5 (6)
Specialty, n (%)				
General and Family Medicine	7 (30)	13 (25)		20 (27)
Internal Medicine	6 (26)	9 (17)		15 (20)
Surgery	4 (17)	10 (19)		14 (19)
Pediatrics	1 (4)	6 (12)		7 (9)
Orthopedics	3 (13)	3 (6)		6 (8)
Psychiatry[1]	0 (0)	2 (4)		2 (3)
Anesthesiology	0 (0)	1 (2)	0,777	1 (1)
Cardiology	1 (4)	0 (0)		1 (1)
Gastroenterology	0 (0)	1 (2)		1 (1)
General Haematology	0 (0)	1 (2)		1 (1)
Oncology	0 (0)	1 (2)		1 (1)
Otolaryngology	0 (0)	1 (2)		1 (1)
Others	1 (4)	1 (2)		2 (3)
User defined				
Emergency Medicine	0 (0)	1 (2)		1 (1)
First-year Resident	1 (3)	0 (0)		1 (1)
Institutions where the physician work besides ED, n (%[2])				
Primary Care	7 (26)	7 (15)		14 (19)
Public Hospital	19 (70)	30 (64)	0,297	49 (66)
Private Hospital	2 (7)	10 (21)		12 (16)
Private Clinic	4 (15)	16 (34)		20 (27)
Number of work hours per month in the ED, n (%)				
≤ 10 hours	2 (7)	1 (2)		3 (4)
11 – 20 hours	10 (33)	7 (14)	0,054	17 (21)
> 21 hours	18 (60)	42 (84)		60 (75)

* - Pearson's chi-squared test

+ - Pearson's chi-squared test after recoding into <30, 31 to 40, 41 to 50 and >50 years.

1 - Includes (n = 1) for Psychiatry and (n = 1) to Childhood and Adolescence Psychiatry

2 - Computed over participants who expressed at least one workplace (Pearson's chi-squared test after recoding into: Category 1 - participant works in 3 institutions in addition to the ED; Category 2 - participant works in 2 institutions in addition to the ED; Category 3 - only works in an institution apart from the ED and Category 4 does not work on any other institution besides the ED).

4.1.2. How often physicians (frequency) seek for patient's medication history

The section from the questionnaire concerning to "Expertise and Opinion" from the respondents is shown in the Table 8, starting with the **question number seven** "In an emergency situation how often you seek for patient's medication history medication history in the ED?".

Table 8 - How often physicians seek for patient's medication history

Results n (%)	Frequency scale					Total	Median	p-value*
	1 Always	2 Often	3 Sometimes	4 Rarely	5 Never			
Residents	21 (70)	6 (20)	2 (7)	1 (3)	0 (0)	30 (100)	Always	0,855
Specialists	35 (67)	12 (23)	5 (10)	0 (0)	0 (0)	52 (100)	Always	

* - Mann-Witney U Test

The table presented shows that the physicians in the ED in median always ask about the patient medication history (residents 70% vs 67% specialists). However it is verified that one resident answer that rarely requests the medication history from the patients.

The Mann-Witney U Test has been calculated and it is concluded that there is no statistical evidence of differences between the groups (p=0,855).

The researcher also tested if the workload at ED (question number 6) was associated with the frequency in which physicians in ED seek for patient's medication history (question number 7), which results are presented in the Table 9.

Table 9 – Association between the workload at ED and how often physicians seek for patient's medication history.

Hours per month in the ED, n (%)	How often physicians seek for patient's medication history (Frequency)					Total	p-value*
	1 Always	2 Often	3 Sometimes	4 Rarely	5 Never		
≤ 10 hours	2 (67)	0 (0)	1 (33)	0 (0)	0 (0)	3 (100)	0,286
11 – 20 hours	15 (88)	2 (12)	0 (0)	0 (0)	0 (0)	17 (100)	
> 21 hours	37 (62)	16 (27)	6 (10)	1 (1)	0 (0)	60 (100)	

* - Pearson's chi-squared test

It was concluded that there is no statistical evidence supporting such association (p=0,286).

4.1.3. Discussion about the importance of accessibility to medication history in the ED

The results from the **question number eight** "Discussion about the importance of accessibility to medication history in the ED" can be seen in the Table 10.

Table 10 – Importance of accessibility to medication history

Results n (%)	**Importance scale**							
	Irrelevant	**Not so important**	**Important**	**Very important**	**Determinant**	**Total**	**Median**	**p-value***
Residents	1 (3)	0 (0)	2 (7)	17 (57)	10 (33)	30 (100)	Very important	0,182
Specialists	1 (2)	0 (0)	13 (25)	24 (46)	14 (27)	52 (100)	Very important	

* - Mann-Witney U Test

The table shows that in median the physicians in both groups (residents and specialists) considered that is very important to have access to patient's medication history.

The Mann-Witney U Test has been calculated and it is concluded that there is no statistical evidence of differences between the groups (p=0,182).

4.1.4. Opinion about benefits with the access to medication history in the Emergency Department

The results from the **question number nine** "Your opinion about benefits with the access to medication history in the Emergency Department?", are shown in the Table 11.

Table 11 - Benefits with the access to medication history in the ED

Results, n (%)	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Total	Median	P Value*
	9.1. Faster characterization of the situation							
Residents	0 (0)	1 (3)	2 (7)	17 (57)	10 (33)	30 (100)	Agree	0,194
Specialists	0 (0)	2 (4)	4 (8)	19 (36)	27 (52)	52 (100)	Strongly Agree	
	9.2. Faster diagnosis							
Residents	0 (0)	2 (7)	5 (16)	17 (57)	6 (20)	30 (100)	Agree	0,431
Specialists	0 (0)	1 (2)	8 (15)	30 (58)	13 (25)	52 (100)	Agree	
	9.3. Better diagnosis							
Residents	0 (0)	1 (3)	3 (10)	17 (57)	9 (30)	30 (100)	Agree	0,924
Specialists	0 (0)	0 (0)	10 (19)	25 (48)	17 (33)	52 (100)	Agree	
	9.4. Better choice in the most adequate therapeutic							
Residents	0 (0)	0 (0)	0 (0)	11 (38)	18 (62)	29 (100)	Strongly Agree	0,571
Specialists	0 (0)	2 (4)	1 (2)	19 (36)	30 (58)	52 (100)	Strongly Agree	
	9.5. To be quicker in therapeutics adequacy							
Residents	0 (0)	0 (0)	4 (14)	13 (45)	12 (41)	29 (100)	Agree	0,512
Specialists	1 (2)	2 (4)	7 (14)	23 (44)	19 (36)	52 (100)	Agree	
	9.6. Better prognostic							
Residents	0 (0)	0 (0)	10 (33)	15 (50)	5 (17)	30 (100)	Agree	0,720
Specialists	1 (2)	6 (12)	9 (17)	22 (42)	14 (27)	52 (100)	Agree	
	9.7. Economic benefit							
Residents	1 (3)	1 (3)	8 (27)	12 (40)	8 (27)	30 (100)	Agree	0,041
Specialists	2 (4)	1 (2)	5 (10)	19 (37)	24 (47)	51 (100)	Agree	

* - Mann-Witney U Test

Through the displayed table it is clear that the options presented: Faster diagnosis; Better diagnosis; To be quicker in therapeutics adequacy;

Better prognostic and Economic benefit, both groups (residents and specialists) agree - the median is equal to "Agree". With respect to “Better choice in the most adequate therapeutic”, both groups also agree – the median is “Strongly Agree”.
However, regarding to Faster characterization of the situation, the groups disagree (the median of the residents is “Agree” while the median of the specialists is Strongly Agree).
The *Mann-Whitney U test* has been calculated and the results from the p-value shows that there are no differences statistically significant between the groups ($p>0,05$) except in the option “Economic benefit” with the p-value=0,041 ($<0,05$).

4.1.5. In a computer application which information should be accessible regard to patient’s medication history

The results to the question **number ten** "In a computer application which information you think should be accessible regard to patient’s medication history?" are shown in the Table 12.

Table 12 – Which information should be accessible regard to patient's medication history?

Results, n (%[1])	Residents	Specialists	p-value*	Total
Posology	28 (93)	47 (90)	0,993	75 (91)
Designation of the medicine (e.g.Paracetamol)	27 (90)	47 (90)	0,641	74 (90)
Dosage (e.g. 500mg)	26 (87)	48 (92)	0,232	74 (90)
Date of prescription	24 (80)	40 (77)	0,958	64 (78)
Patient name	17 (57)	37 (71)	0,132	54 (66)
Pharmaceutical form (e.g. pills or injectable)	18 (60)	32 (62)	0,754	50 (61)
Amount of tablets (e.g. package with 30 pills)	16 (53)	32 (62)	0,376	48 (59)
Number of packages prescribed (e.g. 2 boxes)	19 (63)	24 (46)	0,182	43 (52)
Patient Birth Date	12 (40)	27 (52)	0,243	39 (48)
Date of dispensing of medications	14 (47)	21 (40)	0,670	35 (43)
Specialty of the doctor who prescribed	8 (27)	24 (46)	0,065	32 (39)
Patient NHS number	9 (30)	22 (42)	0,226	31 (38)
Patient telephone number	5 (17)	23 (44)	0,009	28 (34)
Special Regime for Reimbursement of Medicines	7 (23)	19 (37)	0,185	26 (32)
Location Prescription	8 (27)	17 (33)	0,508	25 (30)
Healthcare System Responsible Entity	6 (20)	15 (29)	0,336	21 (26)
Name of doctor who prescribed	6 (20)	9 (17)	0,815	15 (18)
Authorization of generic medicine	5 (17)	9 (17)	0,890	14 (17)
No authorization of generic medicine	4 (13)	7 (13)	0,942	11 (13)
Patient insurance number	3 (10)	8 (15)	0,458	11 (13)
Telephone number of the physician who prescribed	4 (13)	7 (13)	0,942	11 (13)
Patient address	2 (7)	8 (15)	0,227	10 (12)
Name of Pharmacy who dispensed the medications	3 (10)	5 (10)	0,993	8 (10)
Contact of Pharmacy that dispensed medications	0 (0)	4 (8)	0,113	4 (5)
Patient citizen number	0 (0)	4 (8)	0,113	4 (5)
Patient Tax ID number	0 (0)	2 (4)	0,269	2 (2)
Other	1 (3)	0 (0)	-	1 (1)
User defined				
Chronic medication	1(3)	0(0)	-	1(3)

[1] - Computed over participants who expressed at least one information
* - Pearson's chi-squared test

In the Table 12 shown above we can see that stand out (over 50%) the following information that should be integrated in a computer application with patient's medication history: Posology (91%); Designation of the medicine

(90%); Dosage (90%); Date of prescription (78%); Patient name (66%); Pharmaceutical form (61%); Amount of tablets (59%) and Number of packages prescribed (52%).
On the other hand the information less prominent among these is: Contact of the Pharmacy that dispensed medications (5%); Patient citizen number (5%) and Patient Tax ID number (2%).
It is also possible to conclude that in all the answers are no relevant statistically differences in both groups (residents and specialists), since the p-value is above 0.05. However there is an exception in relation to option "Patient telephone number" where the value p=0,009.

4.1.6. Types of medications that should be included in the computer application

The results from the **question number eleven** "What kind of medications (prescribed and non-prescribed) you think should be included in the computer application", are presented in the Table 13.

Table 13 – Types of medications that should be included in the computer application

Results, n (%)	1-Strongly Disagree	2-Disagree	3 - Neutral	4 - Agree	5 - Strongly Agree	Total	Median	p-value*
	11.1. Medications subject to medical prescription							
Residents	0 (0)	1 (4)	0 (0)	7 (23)	22 (73)	30 (100)	Strongly Agree	0,728
Specialists	0 (0)	0 (0)	2 (4)	10 (19)	40 (77)	52 (100)	Strongly Agree	
	11.2. Medications not subject to medical prescription							
Residents	0 (0)	0 (0)	4 (13)	10 (33)	16 (54)	30 (100)	Strongly Agree	0,915
Specialists	1 (2)	2 (4)	5 (9)	16 (31)	28 (54)	52 (100)	Strongly Agree	
	11.3. Homeopathic medicines							
Residents	2 (7)	1 (4)	5 (17)	7 (24)	14 (48)	29 (100)	Agree	0,093
Specialists	7 (14)	5 (10)	8 (16)	14 (29)	15 (31)	49 (100)	Agree	

* - Mann-Witney U Test

Through the displayed table (Table 13) it is clear that both groups (residents and specialists) agree in the options "Medications subject and not subject to medical prescription", with the median equal to "Strongly Agree". With respect

to "Homeopathic medicines", both groups also agree, but the median is "Agree".
The Mann-Witney U Test has been calculated and it is concluded that there is no statistical evidence of differences, since the p-value is above 0.05 (p=0,728; p=0,915; p=0,093).

4.1.7. Other information that should be included in computer application

The answers from the **question number twelve** "Other information that should be included in computer application", can be seen in the Table 14.

Table 14 – Other information that should be included in the computer application

Results, n (%*)	Residents	Specialists	Total
Allergies	30 (100)	51 (98)	81 (99)
Adverse reactions to medicines	29 (97)	50 (96)	79 (96)
Other	1 (3)	6 (12)	7 (9)
User defined:			
Intolerance not clearly defined	0 (0)	1 (2)	1 (2)
Interactions between administered medication alert	0 (0)	1 (2)	1 (2)
Personal background including kidney or liver failure	0 (0)	1 (2)	1 (2)

* - Computed over participants who expressed at least one information

In the table shown above (Table 14) can conclude that 99% of the participants considered that allergies should be included in the computer application and 96% participants considered that the adverse reactions to medicines also should be included.
Can also verify that seven participants selected the option "Other", of which 1 is resident and 6 are specialists. However only 3 specialists responded with the following answers: Intolerance not clearly defined; Cross reactions alert between medication and Personal background including kidney or liver failure.

4.1.8. Comments

The last question of the questionnaire allowed the participant to write some comments that he found relevant. It is verified that only two participants (one Resident and one Specialist) wrote notes.

The Resident (in cardiology) considers that the existence of an application with the patient's medication history would be useful. He further reported that in the institution where he works, he already can access the patient's medication prescribed by a doctor but faces the problem of patients that do not follow the prescribed medication and dosages. There will always be the need to verify directly with the patient about the medication that he is really currently taking.

Regarding the remark made by the Specialist (surgeon) only stated that in his specialty, resorting to Emergency Department is usually away from the correlation between medication and acute situation.

4.2 Interviews in the Netherlands

The results from the interviews are shown below, split by the questions. Note that the answers to the questions were properly updated through feedback received from the interviewees, after being sent an e-mail with the interviews transcriptions. During the interviews other topics were emerging which the researcher considered pertinent. These subjects are also shown in this chapter, following the initial order of the questions from the question list.

The full information concerning the interviews carried out in the Netherlands can be seen in the transcriptions (See in Appendix VI). It is also possible to see the question list sent to the interviewees (See in Appendix V).

4.2.1.By what way do pharmacies allow access to a patient's medication history?

- **Via telephone**
- **Via fax**
- **Via e-mail**
- **Via software application accessed in real-time**

The interviewees answered that they ask the patient's medication history from a patient through phone, fax or e-mail. However the answers are different depending on the function that they perform or the institution.

The **hospital physicians (pediatricians) from Breda** answered that they can ask patient's medication history to pharmacies by phone, fax or e-mail. But they are talking about the outside medication (the medication prescribed by the General Practitioner). There are communication between the family doctor and the local pharmacy, in the cities. If the family doctor is entering the medication in the computer, the pharmacy can see it as well, so they can see both (just when they have the same software from Pharmapartners – Medicom for the GP's and Pharmacom for the local/community pharmacies). But in the hospital they cannot look directly in their system to see the medication that the patient is using, just if they call/fax or send an e-mail to the pharmacy during the daytime. The hospital is implementing the Software EPIC: one system with different modules for each department, but EPIC doesn't communicate with Medicom and Pharmacom. They only can see what was prescribed to patient inside of the hospital. In another hand, hospitals physicians referred that the pharmacies do call them as well about the patient's medication. When it is not clear for them, sometimes the pharmacy calls them to ask what they want to prescribe (e.g. when different medication than the last time and it is not clear for them).

The responses from the two hospital pharmacists are also different because they work in different hospitals (Breda, province of North Brabant and Woerden, province of Utrecht). However there are some points in common.

Regarding the **hospital pharmacist from Breda**, it is important to talk about the indoor medication and the outside medication from the patient. The physicians can see in EPIC the medication of the patients and also their history. All this information is available in the hospital system and the physicians can view it in EPIC. That's the medication that the hospital pharmacy provides to patients. In the hospital pharmacy they are also able to see the medication of

the patients outside the hospital in the electronic system of the community pharmacies from the region (Breda). They don't need to call to the pharmacy, they can see in the system because they have a pharmaceutical service point but just from the local pharmacies in Breda. That service point is located on a few places in the hospital and only the pharmacy technicians can see that information (they have 12 computers in hospital where they can see Pharmacom). Note that in Pharmacom they can't add or change anything and it's only to look for the medication. For example, when the patient is coming to the hospital (e.g. for a surgery) the technician from the hospital pharmacy get a pre-operative screening of medication using the list of the community pharmacy (they print the list every day before the surgery). Then he asks (or the physician) the patient what kind of medication he is using and checks the list to know exactly what medication the patient is using.

The hospital pharmacist also referred that: "We have about 700 000 meetings each year and all those times we have to know what kind of medication the patient is using. Most of the patients don't know what they are using. We did some research a few years ago and about 20% and 50% of what the patient is saying (about their medication) is wrong."

The **hospital pharmacist from Woerden** state that there are two ways to access patient's medication history: by fax and by software applications. Those are the same software applications that the community pharmacy uses. This way they can view the medication from the patient outside the hospital (through OZIS - It's just a database which can be used by different software systems). OZIS It's an Open Care Information System and is not just for the pharmacies, the family doctor they also use this system (not all, but some have access to that information). With OZIS it's possible for pharmacists to exchange medication data by sharing a regionally accessible electronic medication record.

The **family doctor from Etten-Leur** answered that the medication history can be seen using the pharmacy system – Pharmacom, it is via software application, accessed in real time. For emergencies at night and in the weekends they have a general practitioners post here in Etten-Leur and that post is also for the whole region around Etten-Leur. So it's also for the small villages and surroundings. There are working 46 doctors or physicians and there´s also one pharmacist located there and they can look at all the systems of all the pharmacy's here in the same region. Regarding the hospitals, they can they ask medication information via fax or telephone from the pharmacies.

The **community pharmacist from Etten-Leur** answered that usually physicians ask the medication history by fax or telephone. But they always send that by fax. And most of the times they send a fax with the signature of the patient.

The **NBD manager (New Business Development Manager) from Janssen-Cilag (Tilburg)** explained that every pharmacy has a computer and in the computer they have all the patient medication histories. It's online and real-time accessible. For GP's (because mostly they use the same system: e.g. Pharmacom, for pharmacists and Medicom for GP's) the medication information is in their system as well.

Regarding hospital physicians, they need to ask the medication information to the pharmacies: "If a specialist would like to have an overview of the medication from a patient, then he would probably ask the pharmacy or the family doctor to come up with that overview (list). But mostly, in a hospital, it is done during an intake interview with a new patient at the hospital. Then one of the questions is what kind of medication you are using today."

Furthermore, he stated that hospital pharmacist and local pharmacist don't have access to each other's database, but some hospital pharmacists have an agreement with the community pharmacists and they can view the patient's medication data (they have a service point where they can access to Pharmacom).

4.2.2. The access to medication histories is through a computer application: All pharmacies use the same software? There are an institution in the Netherlands that certifies the software used in the pharmacies?

The **hospital pharmacist from Breda** answered that Pharmacom is the only software used from the local pharmacies in that region.

However the **hospital pharmacist from Woerden** referred that access to medication histories is through a computer application, but pharmacies don't use the same software, its different software systems but the same database (OZIS). He also state that there are an institution in the Netherlands that certifies the software used in the pharmacies, but he didn't know the exact name.

The **family doctor from Etten-Leur** explained that in the city (Etten-Leur), all pharmacies (5 or 6) work with Pharmacom and half of the doctors are

working with Medicom. Pharmacom and Medicom belong to the same company – Pharmapartners. In his opinion "What I know is that Pharmapartners with Medicom and Pharmacom is the best integrated system for the medical history of patients." Concerning the general practitioers there are also another systems: "Besides Medicom you also have Pro-medico. I think there still are 3 or 4 different systems."

The **community pharmacist from Etten-Leur** answered that all the pharmacies in Etten-Leur use the same software – Pharmacom.

Besides he mentioned: "We use the Pharmacom software and we use OZIS for people who are from Breda, or other cities, and we use OZIS during evening and night shifts. In the general practitioners center, where the doctors are for the night shifts, we have a small pharmacy and they can access to all computers. And they use OZIS. I can use OZIS also because, for example, some people in Breda have a dentist in Etten-Leur and when they prescribe a medicine I can access to the medication history of this patient because I want to know if it's safe to use the newly prescribed medication in combination with the medication the patient is already using. But like I said previously it's read-only, so I can only read it and give to the patient a paper which tells what kind of medication we delivered to the patient and he has to give that to their own pharmacy. And that pharmacy needs to put that information in their computer again."

To conclude, the Pharmacom system is the connection between the pharmacies from Etten-Leur and the family doctors from Etten- Leur (7 of them). And then there is a connection between all the pharmacies in this region (Breda, etc…) and they use OZIS to connect with each other, but that is read-only: "It's for basic information: what is the latest medication that the patient uses; what are the allergies, which kind of diseases with which you cannot use certain medication, etc. But OZIS is not complete. So you have to ask to the patient, it's your basis (core business) to always communicate with your patient. So this is what we want improve in the Netherlands with the National Switch Point".

The **NBD manager (New Business Development Manager) from Janssen-Cilag (Tilburg)** mentioned that in the Netherlands pharmacies don't use the same software; besides Pharmacom (referred by the researcher) they have other providers.

4.2.3. The access to medication histories through pharmacies is national, regional or local?

The answers are quite different and depend on the function that the interviewees perform in their institution and the region of the institution.

The **hospital physicians (pediatricians)** from Breda only have access to the medication that is prescribed in their hospital, not the medication from outpatients. They don't have communication between hospitals and local pharmacies. For example, they want to know the medication of a patient that is from Amsterdam. In this case they can call to the pharmacy in Amsterdam, but it is only in daytime (in office hours). At night they call to the hospitals because they cannot reach the pharmacy.

In relation to **hospital pharmacists** (from Breda, province of North Brabant and from Woerden, province of Utrecht), they both answered that the access to medication histories through pharmacies is local and maximum regional. The hospital pharmacist from Breda stated that "We can't say that is national because in that case we need to call to the local pharmacy of the patient. National will be with the National Switch Point, but it is not working yet. With LSP it will be possible throughout the whole country to see all medication, also from a patient from the north of the Netherlands."

The **Program manager** from the hospital in Breda answered that the access to medication histories through pharmacies is local and a bit regional, but there's always the problem and challenge to determine where a region starts and what areas it includes. "We have the connection between the regional hospitals and the pharmacies in the region of Breda…we have a very big region where our patients are coming from, there is lot of cities and villages that do not fall into that "region", so you still have a big percentage of patients that are not connected to the system. That's the problem." Further added that some physicians and all pharmacists from the hospital can look into the system of the regional pharmacies (OZIS) but not contribute (add data). OZIS is a read-only system. "We have a kind of network but not all hospitals (throughout the country) are using it, it´s very old and not all pharmacists are connected to it. It is OZIS, the regional network". She also mentioned that in OZIS pharmacists can access each other's medication histories of patients, but only the local pharmacies (the hospital pharmacist don't have access).

The **Family doctor from Etten-Leur** answered that the access to medication histories through pharmacies is local and regional. In the case of a

patient from Amsterdam they just can have information if they call to his pharmacy in Amsterdam.

The **NBD Manager (New Business Development Manager) from Janssen-Cilag (Tilburg)** mentioned that just on local and regional level physicians can ask the medication information. It is possible to access the electronic medication files from the pharmacies in the region, but only the pharmacies, not the healthcare professionals from the hospitals. The healthcare professional can call to the pharmacy or ask by fax and the pharmacy can send the list of the medication. He also stated: "(…) but the reason behind the two systems is that the healthcare professionals don't want to include the indication in the system, for which you get the prescription. Because if the pharmacist want to know the indication, then you, as a physician, can be scared that the pharmacy will take over the rights of the physician (and tell to the patient "so this is the indication so you should have this product"). The physician wants to have the rights, the power, and the control to decide which product should be prescribed. And that's the reason why the systems are not connected. When there already is connection between the systems it's always without the indications. And for the next year, 2012, they are trying to overcome the first hurdle and include, I think, for 5 or 10 disease areas also the indication into the pharmacy system. That's a transition and it's a pilot. So let's see if the pharmacies will use it. So it's very important to understand that we have two different systems: one system for healthcare professionals, for the physicians, and one system for the pharmacies. And several hospital pharmacists can look into the regional pharmacy database."

4.2.4. Patients signed informed consent form?

The **hospital physicians (pediatricians)** from Breda answered that they are allowed to call to a pharmacy to ask the patients medication history but first they ask permission to patients. It is not a written informed consent, it is an oral consent given by patients. But physicians have to document in the patients file "patient allows us to ask the pharmacist".

The **hospital pharmacist from Breda** answered that patients don't sign anything: "They should, but that's very difficult to arrange." It is impossible to make the things in the correct way because they get the information about the patient before the patient is visiting the hospital. For example, when a patient come to the hospital for a surgery they will get all kind of information about what he is going to do in the hospital, about the pre-operative screening and

when surgery will take place. And in this introduction paper is also the information that hospital are able to ask the information from the community pharmacy and if the patient doesn't agree he can raise objections on getting the medication overview from the community pharmacy. The interviewee also mentioned that this was an issue that was discussed many times, but in your opinion "…this is a job for the community pharmacy. The community pharmacy has a different and closer relationship with the patient; we (pharmacy hospital) don't have that."

The answer from the **hospital pharmacist from Woerden** is not so different: patients don't sign an informed consent form but they have to: "Before the patient visits the hospital pharmacy, we already have the information and at that moment we ask "are we allowed using that information". If they say no, then we throw it away but they always say yes, it's ok for safety reasons." For example, in the Emergency Room, physicians ask for a medication list to the pharmacy (to the hospital pharmacy or the community pharmacy).

The **family doctor from Etten-Leur** mentioned that in the Netherlands, the patient doesn't sign an informed consent form. Patients know that general practitioners have connection with the community pharmacy. He also states that: "In general practitioners post, the central post for emergencies at night and in the weekend, there is something written in the waiting room that informs patients that we can look in their history. When I work there, I don't only see my patients, but I see and treat patients from the whole region and they have to know that I can see in their history. Not only the history of the use of medication, but also the rest of their medical history I can see in their own registration (…) We have a big plate where is written that when you have objections against the fact that your history can be seen by somebody else, you have to lets us know that we can block that in the system, that's possible of course."

The family doctor also referred that in the general practitioners post not only the doctors can see that information, nurses also can view: "Every doctor and nurse needs to swear secrecy, confidentiality. (…) So our nurses can see everything we can see." In Medicom (the system for the GP's) nurses also can enter information, they are allowed to write information in the patient file: "But in every file you can see who is writing. So you can see who has done something or who has written something. (…) So I know, when my own patients has been there, I got a message of what has happened there and when

they also looked in my system for the history of one of my patients, then I get a sign that a doctor has looked in my system."

The **community pharmacist from Etten-Leur** stated that when the physicians ask for the patient medication history, they send a fax with the signature of the patient: "Like this we know it is on behalf of the patient. The only reason that we can send medication to a hospital is when somebody (a client of our pharmacy) is in an Emergency room and can't get his medication himself."

But when the researcher asked if the patient sign an informed consent form, the pharmacist answered: "For this system? No, they didn't. When we started this system we didn't have anything, so everybody was included at first. When you don't want to share your data you have tell to us so we can switch it off and you're out of the system."

The **NBD Manager (New Business Development Manager) from Janssen-Cilag (Tilburg)** mentioned that there's no informed consent. The patient doesn't need to sign. He also stated: "That's the reason why the Electronic Patient Record is not going to work at this moment in the Netherlands, because the privacy of patients should be guaranteed."

Furthermore the interviewed told to researcher that everybody in the Netherlands received a letter in 2010 informing that their data could be collected in Electronic Patient Record system, and if they agree with that they should sign for that. But this was just one time, because normally they don't give any consent.

4.2.5. How does a physician/pharmacist identify himself when he wants to access information from the patient's medication history?

- **Number of registration of healthcare professionals**
- **Name**

The **hospital physicians (pediatricians)** from Breda answered that usually they just inform that they are doctors from the Amphia Hospital (the institution where they work) and that they want to know the medication from one patient. Normally they don't have to give their number of registration of healthcare professionals to the pharmacy to get the information.

Regarding the answer from the **hospital pharmacist from Breda**, this question is applied to the pharmacy technician – how he identifies himself

when he wants to access Pharmacom. They have a login code but the problem (which the interviewed don't think is really a problem) is that all the technicians from the hospital pharmacy use the same password. Concerning this subject, the interviewed mentioned: "Because we can't add or change anything in the system and it's only for the pharmacy department. It's only to look for the medication. It's impossible to have different passwords, because we have so many technicians. Pharmacom could give a different user and a different password but for our objective, just to look into the system, one is really enough. The computer is located in the pharmacy and it's only accessible by the pharmacy. So, there's no one else, besides the pharmacy technician and the pharmacist who can get access to the computer."

The **Family doctor from Etten-Leur** answered that he identify himself in the system with his name and his password, just when it is the first time that the doctor enter in the system, then Medicom also want the BIG number (Number of registration of healthcare professionals). He also stated that he can use the system at home, because he has the connection: "What I can do here I can do at home also."

4.2.6. By what way can the patient's medication history be accessed?

- **Health number**
- **Number of civil identification**
- **Full name**
- **Date of birth**
- **Address**

The **hospital physicians (pediatricians) from Breda** answered that they could access the patient's medication history using the patient name, date of birth and sometimes the address. The hospital pharmacist from Breda mentioned that with date of birth and with a patient name they can find the patient. First, they have to know to which pharmacy the patient goes, and in which city, then they enter the date of birth and they get some names and then choose the name of the patient.

The **hospital pharmacist from Woerden** referred the date of birth and the number of civil identification.

The **family doctor from Etten-Leur** answered that to identify the patient in the system they have: date of birth, patients name, family name, address,

postal code, BSN number. They just need to put one of these information items from the patient in the system: "For example, I choose one patient and if I want to see his medication I just need to select the medication and I can see all the medication that he´s using now. If I want to see the medication history I need to select medication history and then I can choose month, year, and two years or even longer." The researcher asked what is the maximum time regarding medication history that he could access, and he answered: "Well, I don't know. Sometimes I can find something from…I´m using this system since eleven years, before we had another one that was replaced for the current one. We started here with this system in 1994, and sometimes I have information in the system that dates back till 1994."

The **community pharmacist from Etten-Leur** answered that mostly they use the date of birth because it's the only thing that never change on the person, and then they have to check if it is the same person. For that they use the barcode: "Because when I'm using the barcode I know exactly that I'm treating the same patient that the doctor saw at his office. When someone comes from the hospital with a hand written prescription that's the big alert for us, because then you have to choose the right person, the right medicine because with the barcode it is already in the system, with the right medicine. That's why we have a double control on this, then another electronic control and then I control it again afterwards. That's the way we do it. But with one of every five thousand recipes we make a mistake, even when we have 4 controls on that! But most of the times are the wrong number of pills. It's not the wrong medicine, it's only the wrong amount of pills, the patient should have 90 pills and we gave 60 pills or something like that. That's 80% of the mistakes that happen. Giving the wrong medicine happens only ones in about 50.000 times, and that is about twice a year in my pharmacy."

The **NBD Manager (New Business Development Manager) from Janssen-Cilag (Tilburg)** answered that the patient's medication history can be accessed with the address, date of birth, full name, health number, civil identification number, because all this information is in the system.

4.2.7. Who can access patient's medication information?

- **Pharmacies**
- **Physicians**
- **Nurses**
- **Patients**

The **hospital physicians (pediatricians) from Breda** replied that pharmacies and physicians could access the patient information. Concerning the patient he also can request his information to the pharmacy or to the family doctor. They also mentioned that normally the doctors call the pharmacy, but depending on the pharmacy, they think if they ask the nurse to ask the information about the medication she will get the information as well.

The **hospital pharmacist from Breda** answered that there are two different situations: access information from outside the hospital and from inside the hospital. In the first case, the hospital pharmacy has the pharmaceutical service point and only the pharmacy technicians and the pharmacy can look to Pharmacom. No one can see the medication except the pharmacy department. Note that pharmacy technicians are pharmacy assistants, who prepare medication for the patient. Furthermore the hospital pharmacist stated that in the Netherlands the pharmacist technicians are very well educated and do a lot of work. If the hospital physician and the patients want to access the outside information they should contact and ask to the local or community pharmacy.

The information from inside the hospital can be accessed through the hospital system. Everything the physicians prescribe for patients inside the hospital are recorded in the system, then everyone can see the information - physicians, pharmacists and nurses (in November 2011 they used the Centrasys software, now - October 2012 - they are implementing the EPIC system).

EPIC is the new software for the internal prescriptions but also for prescribing to outside patients. Other finding related with this question was that the system that they are implementing in the hospital doesn't have connection with the software used in the community pharmacy (they are going to investigate if it's possible to get an interface between Pharmacom and EPIC). Thus they still have to make a print and the patients still need to take it to their local pharmacy. Then in the local pharmacy they enter it in their system (Pharmacom). Concluding, the hospital pharmacist needs to look to

Pharmacom to have the list of the medication from outside the hospital and in Centrasys or EPIC to see the internal prescriptions.

The patient can ask the information, because the patient is the owner of his own medical file (in the local pharmacy he can ask a list of his medication, inside the hospital is not usual).

The **hospital pharmacist from Woerden** answered that pharmacies and physicians can access the patient's medication history but outside the hospital and the hospital pharmacy is the only one who has access inside the hospital. Regarding the patients, they can ask the list of their medication because it's their information. They are the owners of their own medication history: "Patients are the owners of their own medication history. But it's not very well regulated at this point, that's why there's the political discussion about the LSP – National Switch Point."

The **family doctor from Etten-Leur** answered that physicians, pharmacies and nurses can access to patient's medication history. Patients can ask that information to the family doctor, but usually they ask to the community pharmacy.

The **community pharmacy from Etten-Leur** answered that the family doctor and the pharmacies from this city can access to medication history. Patients usually ask their medication list to the local/community pharmacy.

4.2.8. If patients can access their medication history, how can obtain it?

- **With their identification (Citizen Service Number)?**
- **To whom they can request this information?**

The answers from the **hospital physicians (pediatricians) from Breda** were that if the patient wants to know his medication history he can call to the pharmacy but mostly he will go to the pharmacy and asks about his medication list.

The **hospital pharmacist from Breda** referred that the patient can ask his list of medication in the local pharmacy. Inside the hospital is not usual that the patient asks for that.

The **hospital pharmacist from Woerden** answered that patients can ask the medication list to the family doctor or to the pharmacy but there's no access to the database for the patient.

The **family doctor from Etten-Leur** stated that the patient doesn't have access to the system, only through him or the community pharmacies (they only can ask the medication list).

The **community pharmacist from Etten-Leur** answered that patient come to the pharmacy to ask the list of his medication. They created a sort of a standard list, and all the pharmacies use that standard. The standard list contains the name of the pharmacy, the contra-indications, and intolerances for pharmaceutical things, allergies, the doctor which made the prescription, etc. But they developed other kinds of specific lists for the following situations: when patients are going in holidays (they have this list in Dutch and in English); for people who are unemployed and welfare (they need to show how much they spend on their medication); when people want to buy a house and need to show a list of your medication for the last 5 years, for example. Another very important information is that when a patient asks the list and the pharmacy prints that, the pharmacy always need to put the reason why print that for the patient.

The **NBD manager (New Business Development Manager) from Janssen-Cilag (Tilburg)** also talked about this subject, in particularly about the development of a uniform drug list for the pharmacists: "The KNMP is the Dutch Association for the Pharmacists and together with the NVZA, the Dutch Association of Hospital Pharmacists; they developed a uniform drug list. So pharmacists have now a new system from which a uniform format medication list for patients can be printed." So, patients can ask their medication list to the pharmacists.

4.2.9. Institutions in which information can be accessed: Public hospitals; Private hospitals.

The **hospital pharmacist from Breda** answered that they have arranged connection with Pharmacom, because they have good connections with their community pharmacies. It was also mentioned that maybe the private hospitals don't have that connection, so probably they need to ask to the patients when they are coming to their hospital. Or the patient needs to bring his own information, his medication list. For example, the dentist can also ask the medication list to the community pharmacy.

The **hospital pharmacist from Woerden** stated "Public hospitals but also private hospitals by the same way. It depends on your profession and it doesn't depend on the type of hospital."

The **family doctor from Etten-Leur** answered that in this moment public and private hospital can ask the information by fax or phone. They can request information from GP's or the pharmacist but only if the patient give permission for that.

The **community pharmacist from Etten-Leur** mentioned that a private hospital can ask to the pharmacy the list of the medication but only with the informed consent. They need to send a fax with the signature of the patient.

When the researcher ask if a private hospital could access a patient medication history, the **NBD Manager (New Business Development Manager) from Janssen-Cilag (Tilburg)** answered that depends on the way health care professionals are working together: "For instance, in Tilburg or in Breda, I think most pharmacists came together and said "ok, if we want to have shared services during nighttime or during the weekends, it is important that we have access to all the information of all patients in Breda. So let's collect and connect all the available data in our region". And that is the way Tilburg is working as well, because they agreed together to share the data, they can access the data from the other pharmacies as well to have a clear overview. For public hospitals I think is more or less the same. If a public hospital has an agreement with the other parties they would be able to access that information."

4.2.10. Which departments in a hospital are allowed to access information from patient's medication histories?

The **hospital physicians (pediatricians) from Breda** answered that "All departments from the hospital can call to the pharmacy to ask the information and get the information. The principle is the same; it doesn't matter if you are from intensive care or emergency department, etc."

The **hospital pharmacist from Woerden** answered that all departments in a hospital can ask to the hospital pharmacy for the list with the medication history.

The **family doctor from Etten-Leur** referred that all the departments from the hospitals can have the information if they ask by fax or telephone.

The **community pharmacist from Etten-Leur** mentioned that all of the departments of that hospital can ask the medication list, by fax, but only with the signature of the patient.

4.2.11. What kinds of medications become available on the medication history of patients?

- **Prescribed by a doctor;**
- **Medicines not subject to medical prescription;**
- **Homeopathic medicines;**
- **Are there exceptions? (e.g. HIV drugs)**

The **hospital pharmacist from Breda** referred that in Pharmacom (system from the local pharmacies) they can see all kind of medications dispensed by the pharmacy (e.g. normal painkillers), but it depends if the pharmacy put it in the system. Because of that, when they have patients in the hospital for their pre-operative screening, they ask what kind of medication the patient is using through the pharmacy but they always ask which "over the counter products" they are using. They always ask about the medication not subject to medical prescription including the homeopathic products: "When a patient uses four times a day one gram paracetamol, we put it in our system. There is no prescription that the patient has taken it and we want to know that the patient has taken it." The interviewed also mentioned that if they don't put that kind of information in their system then they can't see the possible interactions between the medications, thus they enter as much information as possible in the system. Regarding the question about exceptions, the hospital pharmacist answered that in the hospital and in the pharmacy they do not have any exceptions. But it is possible that sometimes, in the system of a hospital in the Netherlands, you may not put in the medication if the patient requests that.

Related to this question the interviewee also mentioned that the pharmacist enters in Pharmacom what he sells to the customer (what the patient is using) and not the prescription from the doctor, because probably the patient didn't buy all of the prescription: "They (the local pharmacy) deliver medication and they (the local pharmacy) can see when the patient has to come back for more. Sometimes they discuss that with the patient (are you still using the medication). If the patient doesn't say anything, then the pharmacy doesn't know. It's a problem. We only see what was dispensed. It could be another prescription but then it can be that the pharmacy has called the physician to say "this is not the right prescription or it's not good in combination with other medication, we have to change it". Then they enter it in the system. So we only see what is delivered not what is prescribed."

The **hospital pharmacist from Woerden** answered that all kinds of medications could become available on the medication history of patients but it depends on the pharmacy. The pharmacies try to record everything they know about medication, also the homeopathic medication and the medication like the paracetamol which is not prescribed by a doctor. Furthermore stated that the medication list usually are not complete so they always have to ask the patients (together with the medication history) what is really used by the patient and then make a complete list of what's really used at that moment. When the researcher ask him if there are exceptions (if patients don't want that some information became available in the system, e.g. medication for AIDS) the interviewed answered that in the hospital they don't have exceptions, they try to record everything they can about the patient's medication. He also stated "Can a patient ask to leave out information or ask to make it not visible to anyone else? No, in the near future we want to arrange that but at this point we can't make exceptions at that level. But, of course, for privacy reasons we need to arrange that kind of option."

Following the answer to this question the interviewed took the opportunity to explain how the distribution system from the hospital pharmacy functioned: the physician asks the patient what kind of medication he's using and compare with the list from the community pharmacy. Then he's going to put that information (new information) in the electronic prescription system of the hospital and the distribution system from the hospital pharmacy would recognize that (medication checked signals) and have access to that information. "This is the automated way of medication checks. If there's an interaction between two different drugs or there's a dose that's too much for this patient or the patient has problems with his kidneys and he needs another dose, that's how we check all the patients' medication."

Regarding to this question, in particularly about exceptions, the **Program Manager** from Breda confirmed that the patient can requests some information to be deleted from the system: "When a patient wants some information to be erased, we have to delete it. It is the right of patients." For that the patient has to sign a paper declaring that he wants the information deleted.

The **family doctor from Etten-Leu**r answered that he doesn't have access to medicines not subject to medical prescription: "Even when the patient is buying medicine in the pharmacy, which is not prescribed, it's not in the system. It is maybe possible that the pharmacy can see what they sold to the patient in their own system, but we, the doctors can't see that, we only see the

prescribed medication." The same for homeopathic medicine, just in the cases that it was prescribed.

Regarding exceptions, the researcher gave the example from Massachusetts, where physicians had access to patient's medication history in the emergency, but the patient's history was incomplete caused by the Massachusetts restrictions on the display of mental health and HIV. The family doctor explained that in their system (Medicom) doctors can make a private prescription and the pharmacy can see the prescription but another doctor can't see. He also said that he don't know if the pharmacist can do the same in Pharmacom (system from the pharmacy).

The **community pharmacist from Etten-Leur** mentioned: "(…)most of the time people don't like it when the doctor can see what they buy in the pharmacy (not prescribed), so I check all the medication that the patient buys but in the system the doctor just can see what was prescribed by him. But when I see that the medication that the patient wants to buy can interact with the medication prescribed by the doctor, I can call to the doctor."

Usually the pharmacy register some medications that are not prescribed by the doctor: "We have six groups of medication which we have to put in the system before we sell that. (…) I can give you some examples: high doses of ibuprofen, some medication to lose weight, medication for nausea, etc. So there are six large groups of medication that we need to register in the system."

He also mentioned: "In the Netherlands we have drugs in 3 types and you can see the code in every pack of the medication: UR, which means that it is only with a prescription; UAD, which means only pharmacy and drugstores and there is UA, which means only in pharmacies. Medication which is only sold in a pharmacy we always have to put in the system. Most of the times this medication [UA] is safe to use and you don't need the prescription from the doctor but sometimes we need to check. So you have medication that you can buy everywhere, medication that you just can buy with a prescription and medication that you just can buy in a pharmacy.

For example, when you have medication with the code UA you can buy that here in the pharmacy but first I need to check the system for more information about the patient. And before I can sell that kind of medication I have a list of questions that I should ask to the patient."

About homeopathic medication, they can sell in the pharmacy, but they don't put in the system. The main reason is that homeopathic drugs are not medication according to the Dutch law. All the medication in the Dutch law

has a RVG-number – Register for pre-packed medication, and homeopathic drugs don't have a code.

The **NBD manager (New Business Development Manager) from Janssen-Cilag (Tilburg)** also pronounced about this subject and referred that all the medication prescribed is available in the system are there are no exceptions (e.g. HIV medication). Furthermore he stated: "But what you see is that patients with HIV are going to specialized pharmacies. Often they don't go to their own pharmacist to get their HIV products(…) Nowadays HIV medication is becoming very complex (…) And that's why some pharmacies are now becoming more or less experts and really specialized in HIV medication and that's why patients are willing to travel for an half an hour or more to a specialized pharmacist."

4.2.12. For how long the medication history is kept?

- **How many years;**
- **The last year;**
- **Months**

The **hospital pharmacist from Breda** answered that they need to keep the history for 15 years by law (also for local pharmacies). Besides mentioned that when they did not have an electronic database, it was by paper and they also had to keep that for fifteen years: "We still have the same software from last century. So we have about 30 years of information."

What they put it in their computer system is not the original prescription. This one is still on paper in the hospital, because there is the signature of the physician. And because they don't scan (they enter in their system) the original prescriptions are on paper and it's why they have to keep those papers. But this will be different with the new system EPIC: "Then it's all in one system and we don't have paper anymore."

The **hospital pharmacist from Woerden**, the **program manager** from Breda and the **family doctor from Etten-Leur** gave the same answer: 15 years by law.

The **community pharmacist from Etten-Leur** answered that they need to preserve all the recipes for 15 years: "So if I need to see some recipe I need to be able to find it in the system because it's almost impossible to find it in the archive."

4.2.13. Which information is available regarding medication history (e.g. internal prescription)?

The medication history contain information, such as: internal prescription (e.g. medications prescribed and administered in the emergency); or medications dispensed to the patient in the hospital (e.g. in ambulatory surgery, the patient often takes with him medication dispensed by the hospital).

The **hospital pharmacist from Breda** answered that the history of medication does not contain that kind of information because patients don't get anything from this hospital. Furthermore she stated: "I don't agree with that, I think it's better to give medication for one or two days to the patient, so that he doesn't have a problem when he gets out hospital and first needs to go to the local pharmacy to get the medication." So, the patient is going home the technicians will fax the medication list of the patient to his own community pharmacy and then the patient can get his medication over there.

The **hospital pharmacist from Woerden** responded that the history of medication does not contain more information like internal prescription. The history of the medication or the list of the medication which is in the community pharmacies does not have the internal prescription. Contrary to what happens in the hospital in Breda, the interviewed said that in the hospital in Woerden they give for 2 or 3 days medication to overcome the lack of time. But the medication list does not contain this information.

The **program manager from Breda** answered that all the medication prescribed by the doctor and also medication that patients buy over the counter will be in the system, because they want to have a total overview. But she's talking about the system that they are implementing in the hospital – the EPIC system; she's not talking about the medication history which can be seen throughout the community pharmacies. Furthermore she stated that the system (in the community pharmacies) allows seeing medications prescribed by the physician and dispensed by the pharmacy.

The **family doctor from Etten-Leur** stated that the medication history does not contain information, like medications prescribed and administered in the emergency or in ambulatory surgery: "(…) it's because you don't have any connection with the hospitals." But, for example in the emergency, sometimes the emergency physician sends the report from the emergency episode to give to the family doctor and then the family doctor put in their system (e.g. new

medication or new allergies). It is the same when the patient is going to see a specialist: "Normally it works in that way. With a simple control visit it doesn't happen all the time because sometimes it's not necessary, but when he's doing some really new examinations you get a letter and also going electronically, by email. If the patient has an appointment with a specialist in the hospital I receive a message in the system (in Medicom) with a report of that appointment. I can see the name of the doctor that saw the patient, what time and in what day, what's the history, etc. When I receive that message about the patient I read what happened and make a conclusion and then I put that in the file of the patient (in Medicom). When I receive the report or message in paper takes more time but we also put that information in the system."

4.2.14. Which information is available regarding the medication history?

In this question the researcher presented some options to the interviewees, such as: Local of Prescription; Date of Prescription; Name of doctor who prescribed; Specialty of the doctor who prescribed; Telephone number of the physician who prescribed; Date of dispensing of medications at the pharmacy; Designation of the medicinal (Paracetamol/Codeinefosfaat Sandoz); Dosage (paracetamol 500mg, codeinefosfaat-hemihydraat 20mg); Pharmaceutical form (oral); Amount of tablets; Posology; Medication allergies and others.

The **hospital pharmacist from Breda** mentioned that they can see the medication in use and the medication history, in the following information's: date of prescription (the date when the medication started); name of the doctor who prescribed (they see the specialty of the doctor but not always the name); the specialty of the doctor who prescribed; the pharmacy who delivered; date of dispending; the dosage; the pharmaceutical form; the amount (how much medication is delivered and how often the patient has to take it); Posology (Indications, if they are put in) and Medication allergies.

About the medication allergies she also stated: "Medication allergies it's the most difficult part for all pharmacy departments. For example, the patient says that he is allergic to a certain medication because he had diarrhea when he was using this medication. In reality it might not have been an allergy, and the patient was just sick. But if the pharmacy has entered this allergy in his system we have a problem when the patient needs this medication. You can't give the

medication because it can give an allergic reaction, when probably it is not! So, that's very difficult to get the right information about allergy."

They also can see the Contraindications, for example if a patient get some medication because he has hypertension, but this patient has also some other problems for which he's not allowed to have that medication - That's contraindication.

The **hospital pharmacist from Woerden** answered: specialty of the doctor who prescribes; name of the doctor who prescribed; date of prescription; designation of the medication; pharmaceutical form and posology. Note that the date of prescription and date of dispensing are the same in the hospital pharmacy but in the community pharmacy that can be different.

Related with the amount of tablets the pharmacist stated: "Amount of tablets that depend. When we prescribe at an outpatient treatment then we have an amount of tablets but inside the hospital we only have a period of time and we don't have the amount. You can calculate it but we don't enter it in our system. We only enter a period. When it starts and when it ends." He also mentioned the contraindications like the other hospital pharmacist.

The **family doctor from Etten-Leur** answered that the information that is available regarding the medication history is: Date of Prescription; code of the primary doctor (not the name); Specialty of the doctor who prescribed the medication (not the name); Date of dispensing of the medications at the pharmacy; Designation of the medicine; Dosage; Pharmaceutical form; Amount of tablets; Posology and Medication allergies.

The **community pharmacist from Etten-Leur** answered: Location Prescription (e.g. name of the hospital where the doctor works); Date of Prescription; Name of doctor who prescribed; Specialty of the doctor who prescribed; telephone number and address of the physician who prescribed; Designation of the medication, Dosage, Pharmaceutical form, Amount of tablets, Posology; patient name; patient address, birth date; patient identification; patient insurance number.

4.2.15. Other subjects: Information campaign in the Netherlands "If you go to the doctor, bring your medication list"

The **hospital pharmacists from Breda and from Woerden** explained to the researcher the purpose of the campaign and in what way would be performed. In November 2011, there was an information campaign in the

whole of the Netherlands. Everywhere it was possible to see posters on the wall: "If you go to the doctor, bring your medication list".

It was a campaign organized by community pharmacists together with hospital pharmacists. The objective was that patients go to their pharmacy and bring their medication history when they visit the hospital. They asked for patients to pick up the responsibility of being aware of what they use for medication when they go to the hospital too; to be able to deliver the information.

It's also a responsibility for the patient and usually they don't know their medication. They have to know what kind of medication they are using. And if they don't know, because it's too difficult to pronounce, they should write it down and have always the list with them.

Patients should go to their local pharmacy and ask their medication list, but it is important that they check the medications that they are using to update the information.

The **community pharmacist from Etten-Leur** also talked about this subject: "Last year (2010) we had a new law that obligates all the pharmacies to use software (like pharmacom) that can create a medication list for the patient. And we (pharmacists) tell to every patient when they go to the doctor "please take your medication list", because the doctor (the specialist) doesn't always have access to our system. The campaign is about that: when you go to the hospital, always go to your pharmacy and get your list of medication. We have a database of the patient's medication and that's our responsibility, but most important of all, the health of the patient is the responsibility of the patient himself. It is their responsibility and everybody needs to know why they are using the medication they use. When you talk with elderly people and you ask to them why they are taking that medication, they mostly don't know!"

The **NBD manager (New Business Development Manager) from Janssen-Cilag (Tilburg)** also pronounced about this subject and in his opinion maybe it is a good idea that patients should always have a list of the medication that they are using, but that will be very difficult, especially because older people have a huge list of medication. In his opinion "…the most appropriate way to have access to all the medication will be with a kind of a bank card. And every time you have new medication you just need to ask to put that information on that card."

4.2.16. Other subjects: Family doctor and family pharmacist.

The researcher wanted to understand what kind of relationship exists between the family physician and the community pharmacy and the systems in common use (e.g. how they communicate with each other) and understand the concept of family pharmacist.

The **hospital pharmacists from Breda and from Woerden** mentioned that the physicians and the pharmacists organized together a system that records the used medication from patients.

In the Netherlands patients can go to another pharmacy, but mostly they go to their own pharmacy. It's better to go to their own pharmacy, because pharmacists know everything about their medication - what they are using at the moment and what they have been using.

The fact that patients usually visit the same pharmacy in the Netherlands bring many benefits to them, in particularly they are more protected against drug-related problems, prevents duplication of drugs and drug interactions.

The **Family doctor from Etten-Leur** explained how the situation in the Netherlands is: "In the Netherlands the patients chose a doctor and when they stay in the same city and don't disagree with him they are always treated by the same doctor. So normally you go always to the same doctor. In this practice we have 4 doctors and if your own doctor is busy you can go to another and he can look in the same system. The system is based on that…that's one part of the relationship; one patient belongs to one doctor. The philosophy is that when you, as a doctor, learn to know the patient, how he is coping with his illness, what's happening in his surrounding with is family and it that could influence his health. So the best thing is to keep the same doctor so he knows your background and it will be easier for him to do the right things."

He also stated that it is the same with the pharmacies: "A pharmacy has also a group of patients. When someone goes to live in another area of the city he'll maybe change to another pharmacy. Mostly he doesn´t change to another doctor but more easily to another a pharmacy. Usually he keeps always the same. In the Netherlands the pharmacists and the doctors use the same computer system for the medicine. The company which makes the software for this has a branch of this system that goes to the pharmacist and another branch which goes to the doctors." It was an agreement that doctors made with the

pharmacists in Etten-Leur, so physicians or family doctors can see the information from the pharmacists.

For example, in emergencies at night and in the weekends they have a general practitioners post here in Etten-Leur and that post is also for the whole region around Etten-Leur. So it's also for the small villages and surroundings. There are working 46 doctors or physicians and there´s also one pharmacist located there and he can look at all the systems of all the pharmacy's here in the same region.

Another finding related with this subject and that the family doctor stated was: "The pharmacist can only see the medication and the contra-indications, intolerance, and allergies. He cannot see anything about the medical history of the patient. When, for example, I do something at general practitioners post, for a patient that I don't know, and I don't look in the system to history of this patient, and I prescribe him some medication which is not good for him, the system will show a warning or alert signal, also at the pharmacy."

The family doctor also stated that: "We also have a new system within Medicom and Pharmacom where the pharmacist gets a signal when, in case of chronic medication, the medicine that a patient is using is almost finished. Then the pharmacist will give a signal to the patient that their medication is nearly ended and they will make a new prescription for that patient. Then I get a signal that the pharmacy gave a new recipe to the patient. The pharmacy gives a message to the patient, which goes by postal mail, informing that there is a new medicine available for him. But first I receive a signal from the pharmacy and I need to agree with that. This is very new! "

Another interesting outcome was that nurses can make the recipe with the family doctor agreement: "Many patients call to the medicine line (a telephone line) to ask new medicine and when it is chronic medication my nurse makes the recipe and I have to agree. Normally when a patient has a chronic disease, depending on which kind of disease (for example, high pressure and heart attack), we usually do some controls during the year, but once a year we do total control (blood pressure, cholesterol, etc). When the patient is at home we usually prescribe medication for the whole year. In these kinds of cases, when the patient asks for new medication, I first need to see if the patient came to the yearly control. If not, I usually prescribe just for the next two weeks but in the recipe I write a message saying that he needs to come to the yearly control."

The family doctor also talked about Medicom (one of the systems for GP's), and some information's are quite important for this study, such as: "We can see allergies and signals (alert symptoms). For example, I can see in the system that

the patient is intolerant to some medicine. The system gives a signal if somebody has some disease so he can't use some medicine. So the system gives an alert signal when I would give (prescribe) a medicine which the patient can't use. And you can also see in the system how much the patient uses, the doses, who as given the recipe (prescription), till when the medication is being used, for how long is already being used and starting moment. In our electronic system, when I have the diagnosis from the patient, and I select a prescription, I can make my own choice and the system can also make a choice, and in that case it will be cheaper for the patient. The system will have preferences based on protocols."

The family doctor also informed that they use the ICPC- International Classification for Primary Care, for diagnosis: "The entries in the software system allow allocating the diseases in order of appearance and frequency. This facilitates combinations and diagnosis and ultimately the correct prescriptions." Furthermore he stated that: "When you give the diagnosis codes that you try to be as accurate as possible, and when the patient is sent then to a specialist in a hospital, he will return with the correct diagnosis, in a letter written by the specialist. Then I can change the information in my system and enter the new, more accurate, diagnosis code. The other doctors from my practice center can do this to in case, for example, I am sick or absent."

The **community pharmacist from Etten-Leur** mentioned: "We have here in Etten-Leur 14 family doctors and 5 pharmacies. The 5 pharmacies are all on the same computer network. And from the 14 doctors 7 of them are on the same network as we are. So, what we share is all the common things like family name, insurance company, etc. The doctors can also see the medication that we sold to their patients in the pharmacies. Like this they always know exactly the stages of the patients, what they are using or what they are not using, because the family doctor doesn't know what the specialist (in a hospital) prescribed. When we deliver this medication, prescribed by the specialist, the family doctor will know this through our mutual system. He has access to all the latest medication stages of the patients. The doctors that are not on our network can send us messages and when a specialist prescribes something we send those family doctors a message and they can put that in their own computer system. But I don't know if they do that. So it's better to have a mutual network because what we put in here is the latest stages of the patients. This is what's happen in Etten-Leur."

The pharmacist also talked about OZIS: "The Netherlands has a few OZIS rings (areas), we (in Etten-Leur) are in the ring of the city of Breda. So the

hospitals in Breda as well as the pharmacies in Breda (and surroundings) can have access to the latest medication history of the patients. Not all the doctors but only the pharmacies."

Besides he stated: "And I can also access to some of the laboratories, for information from patients when I need to know what the status of their organs (liver, kidney, etc.) is so I can adjust the doses of the medicine. So I don't have to call to the doctor, and I can access to that information and use it. Because our job is to make sure that everything we sell is safe for the patient but also the patient has to need it and we have to give some information to the patient like how to use it the best possible way to make it more effective. That's our job, not only selling medication…"

Furthermore pharmacist spoke about the chronic medication of patients, as mentioned by the family doctor: "Normally, before the new system, when you have your medication every three months you have to call every three months to your doctor for the new prescription, the prescription goes to the pharmacy and you go to the pharmacy to get the prescription. So, when someone has medication for example for diabetes or something like that every three months it's the same medication. Now we're using a system. In the computer I can see exactly when the patient is almost out of the stock so I create a new package for him and I ask the doctor for the authorization. So the patient doesn't need to call to the doctor himself. This is much easier for the patient, it is easier for us as well because I know exactly when I can do the work, it is easier for the doctor because it means less telephone calls and it is also a good system to see if patients are using their medication correctly. For example, when people use medicine, sometimes they forget the medicine or they take two when they need just one, etc. So when we call the patient to say that the new package is ready for him and he says "I still have 5 packages at home", I know, and the doctor knows, that he is not using the medication in the right way."

Besides he stated: "We have an authorization from some family doctors, so we made a list of medicines which we can always give to their patients. For some medicines the family doctors always want to see their patients first, so we can't give those medicines automatically. Then we ask to the patient if they like us to call them if their medicine is ready for them, because it's their medicine and it's their privacy, so they have to sign for that in advance. But most of the people like it because they don't have to go to the doctor and wait for a long time there…Now they know that after a week the medicine is ready for them in the pharmacy and they go to the pharmacy when they like."

Further, the community pharmacist explained why the patient in the Netherlands has to choose only one pharmacy: "In Netherlands you need to say to your insurance company what is your own pharmacy. You can go everywhere you like but you have to choose one which is the owner of your database."

4.2.17. Other subjects: The process of receiving the prescriptions in the community pharmacy

The process of receiving the prescriptions from the family doctor was referred by the **community pharmacist from Etten-Leur** : "When the doctor makes a prescription it goes directly to my printer, where it directly comes out with the barcode. I can see from which doctor this prescription is and for which patient he wrote the prescription. This is the part of the system that we share. This is what he does and he sends that to me and I only have to put it on the (barcode) scanner and I have this recipe. (…) then one of my assistants will get this medication from the stock and another assistant will control that. Then we also have the control with the barcode of the medication so we have a double control on it. Sometimes also the computer system will give a signal (a contraindication) because, for example, in this case, this lady is breastfeeding so we have to make sure that it's safe for her to use this medication. After that and when it's done I have to control everything again and put it through the (barcode) scanner again. This is the final process of control system. Then we need to preserve all the prescriptions and put them in a big archive."

The researcher asked to the pharmacist if he could explain the drafting process of the labels that are placed on the boxes of medication. The pharmacist stated: "We put a control label on the box of the medication (...) On the label you have the name of the patient, date of birth, address, the number of the code from the recipe (each recipe prescribed by a doctor has a unique code), how to use it, some warnings about how to use it and the indications – a small diagnosis (for people that are taking many different medications, to make it easier for them). I scan the barcode of the recipe and I check if everything is ok with the patient and when I see that it's ok, I just need to press "enter" and the label comes out of the printer. In this case we have 3 labels for the medicine because the doctor prescribed 3 boxes of medication, it's an address label, a barcode label for the scanner here and the archive, a control label for me for the end of the day and sometimes a warning label with what I have to do. And this is what we do electronically also, when we get this prescription and the

computer says "it's safe to use", for example for the breastfeeding, I need to enter "yes" or "no" myself. I have to logon on to show that I have seen that, and this is only for me to control it."

4.2.18. Other subjects: E-prescribing in the Netherlands

The **hospital physicians (pediatricians)** from Breda mentioned that the electronic prescribing was going to start in 2012 (through the feedback received, the researcher was informed that they are starting now – November 2012 – prescribing electronically).

At the moment (November 2011) they write the recipe by hand but the GP's (General Practitioners) are much more developed in this sense; they prescribe electronically since many years. Nearly all the GP's do that; but they can still prescribe by hand. For example, when the doctor is doing house visits he prescribes by hand but when he comes back to his officer he will put all those prescriptions in the computer, so the record is complete.

The GP's prescribe electronically and they have different programs, one of them is Medicom (from Pharmapartners).

Relating to the hospital pharmacist from the hospital of Breda, the interviewed answered that in the Netherlands they have a law which says that they have to prescribe electronically on the 1st of January 2012. It is an obligation imposed by the Inspection of healthcare. It is mandatory but some hospitals will not be able to reach this goal. If hospitals demonstrate that they are working on it they will not have problems for not complying with this deadline.

It is the case of this hospital, and the main reason is that they are changing the complete software of the entire hospital (according to the feedback from the interview transcription they will start the implementation in november 2012).

The **Program manager** from the hospital of Breda (same hospital mentioned above) also mentioned that it's an obligation to start the electronic prescribing in January 2012. She stated that it is an obligation to all the doctors, without exceptions. "The goal is to have an entirely paperless system and isn't necessary for the prescriptions to be signed by the doctor. Then you make a prescription in the system and you sent it to the pharmacist by the system…"

The **family doctor from Etten-Leur** answered that he prescribe everything electronically, even when he goes to visit a patient at home. Only when it is an emergency he give the medication directly to patient, but otherwise he goes

back to the practice and he put it in the system and then send it to the pharmacy. The pharmacy receives the prescription electronically. And at the end of the day, the patient can go to the pharmacy and pick up his prescribed medication and don't need to go with the recipe (prescription) in his hand.

4.2.19. Other subjects: LSP – National Switch Point

Notes: The National Switch Point (LSP – Landelijk Schakel Punt) was developed by NICTIZ; the National ICT Institute for Healthcare, together with the Dutch Health Ministry.

Concerning the National Switch Point **the hospital physicians (pediatricians)** referred that the government want to make one access point in the Netherlands where all the medical data will go, but for it is not safe enough. They also stated that for politicians the security of the data is more important than having communication between the different systems. "It is not allowed in the Netherlands because medical data is secret and there probably will be no solutions for these safety and privacy issues in the next years. "

The hospital pharmacist from Breda referred that with the National Switch Point everyone in whole Netherlands got a letter asking if we want they information in that system. And patients can say "no I don't", then the patient is not in the system and no one can't see anywhere what medication the patient is using. " If you have an emergency problem, then no one knows what kind of medication you are taking. But, every person has this possibility to say "I don't want to give my information"."

The hospital pharmacist also thinks that with the National Switch Point maybe more patients will say "I won't… I'm not happy to have my information over there in the system…everyone can see it". Furthermore she thinks when a regional system like in the Netherlands exists, no one ever thinks about it. She stated "Maybe it's not so big, like a system for the whole country. It's just a region and like that we don't have the problems which the national database has. In all these years in which we get the information from the local pharmacies, only one patient was not happy that we had that information."

The Program manager from Breda also pronounced about this subject and explained the reason of LSP cancellation: "At first was a privacy issue, and NICTIZ didn't get the right connection, so pharmacies, GP's and hospitals didn't want to join LSP. And then government ordered to the LSP that they had to make (built) their own customers… So hospitals, GP's and pharmacies

said - we will pay for the service when it is ready and functioning - so in the end that´s why the program stopped." In her opinion, working on the regional connection system, like they work in the Netherlands, it is not the solution.

The **Family doctor from Etten-Leur** also talked about this issue and mentioned that: "In the policy there was a countrywide system that would make it possible for everybody, every doctor, to look in the system and the patients agree that he is looking. But the policy is canceled for now, after already having invested millions and millions of euros in that system. So now we are trying, with all the doctors, to do something. Maybe we'll not go as far as originally planned in the policy, but we want to do something to make it easier to look in one system from everywhere in the Netherlands. That's the LSP."

Likewise the **community pharmacist from Etten-Leur** talked about the LSP and mentioned that because the regional network OZIS is read-only, in the Netherlands for several years were trying to make a system which is not read-only but accessible for all pharmacies, all doctors, etc. "The National Switch Point is not ready because of privacy issues and because of another problem which is when you participate in the National Switch Point as doctor you need to put all the diseases in a specific way in the computer (with a code), because otherwise you cannot communicate properly with the other participants and that would be a problem." Besides he mentioned: "(…) there is no uniformity. The danger of that system is when you access to the National Switch Point and you see the medication, the diseases, etc. from the patient and you think that is all the information, but it's not! Most of the time there's more, so I better know nothing than I just know a half of the information (and draw the wrong conclusions)! When I will think everything is there it's very dangerous! And that is the problem with the doctors. They won't tell you because they say that there is no problem but this is the biggest reason."

The **NBD Manager (New Business Development Manager) from Janssen-Cilag (Tilburg)** also pronounced itself about this subject stating that in the Netherlands they have 2 different systems: the system of the physicians and the system of the pharmacies. At this moment they are not connected. The Government wants to have an electronic patient record, the National Switch Point, and really make it into one system for all of the Netherlands, where everybody (healthcare professionals) is connected to. But in April 2011 the law which should make this possible, was declined. Currently the system is on hold and at this moment there is no effort anymore to solve the issue and really build one system. So at this moment we have one system for the pharmacy and one system for the healthcare professionals.

He also stated that NICTIZ is the the National IT Institute for Healthcare in the Netherlands and was the company that was behind the electronic patient record, which the Government canceled (2011).

According the feedback from the interview transcription and the e-mail that the researcher sent asking about the current situation in the Netherlands (September 2012), the interviewed informed that the Ministry of Health has transferred the LSP to a separate organization called Vereniging van Zorgaanbieders voor Zorgcommunicatie (VZVZ) - Association of Healthcare providers for Healthcare Communications. In November 2012 the VZVZ will start a campaign towards patients to ask their permission to include the patient data in the LSP (by Opt-in). They are going to ask everyone to fill in a form (at their doctor, pharmacy, or online) to allow their information to be accessible for all healthcare professionals in the Netherlands.

5. Discussion

This chapter discusses the results from the questionnaire applied to the Portuguese Public Hospitals as well as the results from the interviews carried out in the Netherlands. Moreover present the research limitations during this study, the main findings of this study and the main recommendations for a possible implementation of a project in this context in Portugal (bearing in mind the current scenario in the country).

Through this study the researcher was able to get some answers about their investigation question: Accessibility in the Emergency Department to Patient's Medication History. The major contributions were obtained both through the questionnaire conducted in Portuguese public hospitals as well as through the interviews carried out with health professionals in the Netherlands.

Besides trying to get the opinion of physicians already with some or extensive experience working in the emergency department, was also considered important to understand the residents views which are still in a learning phase. Through the questionnaire was possible to obtain the following information:

- The physicians that perform functions in the Emergency Department always ask about the patient medication history and they consider that is very important to have access to patient's medication history.
- However it is verified that one resident answer that rarely seeks for the patient's medication history. Throughout the data collected from the questionnaire, the researcher found that it is a resident which studies the specialty of pediatrics. Most interesting is, when the researcher asks about the importance of having access to patient's medication history in ED, the resident answered "very important". The resident may have answered "rarely" to this question, because children are

accompanied by the child health consultations in health centers of the SNS – equivalent to NHS, and parents always bring the child's heath book which contains very useful information about child's health.

- ED Physicians strongly agree that the accessibility to patient's medications history bring several benefits regarding the patients safety, in particularly they can have a faster characterization of the patient situation and provide the best adequate therapeutics. The physicians also agree that they could have another kind of benefits like: make a faster and better diagnosis**;** the decision about the therapeutic would be faster; they could make a better prognostic and that represents an economic benefit (to patients, to physicians and even to the hospital).
- Regarding the information's that physicians think should be able to access in a computer application with the patient's medication history, the responses were (over 50%): Posology; Designation of the medicine; Dosage; Date of prescription; Patient name; Pharmaceutical form; Amount of tablets and Number of packages prescribed. The respondents considered that allergies and the adverse reactions to medicines also should be included in the computer application. About the types of medicines, physicians strongly agree that they should access to Medicines subject and not subject to medical prescription. In addition they give importance to have access to homeopathic medicines.
- However there was a comment from a physician quite important for this study (which is consistent with the information obtained through the interviews in the Netherlands). Even when the physician can access the patient's medication history the problem is that patients do not fulfill the prescribed therapy. There will always be the necessity to interrogate the patient about the medication that he is currently taking.

The interviews in the Netherlands allowed the researcher to get an overview of the functioning of the health system. The objective was to talk with all the stakeholders witch could be important for the study of the electronic medication record (community pharmacists, hospital pharmacists, physicians, family doctor and a pharmaceutical company).

The interviews allowed collecting very important information, such as:

- The researcher wanted to understand what kind of relationship exists between the family physician and the community pharmacy and the

systems in common use (e.g. how they communicate with each other) and understand the concept of family pharmacist.

a. Physicians and the pharmacists organized together a system that records the used medication from patients. In 1999, the Ministry of Health and the Royal Dutch Society for Pharmacies (KNMP) made an agreement in which results the incorporation of the pharmacist care into the Dutch Medical Treatment Contracts Act (WGBO). Thus pharmacists need to access patient's medication data for the patient's safety. (Pirnejad, Bal, Stoop, & Berg, 2007)
b. Usually pharmacists and GP's use the same computer system for the medicine (e.g. in Etten-Leur, pharmacist use Pharmacom and GP's use Medicom, this software is from Pharmapartners) - so family doctors can see the information from the pharmacists.
c. The pharmacist can only see the medication and the contra-indications, intolerance, and allergies. He cannot see anything about the medical history of the patient.
d. GP's can also see the medication that pharmacists sold to their patients (medication dispensed).
e. Regarding chronic medication of patients - In the computer pharmacists can see exactly when the patient is almost out of the stock, so they can create a new package for patient and ask the GP for the authorization. So the patient doesn't need to call to the doctor himself. Sometimes pharmacists have an authorization from some GP's - they made a list of medicines which the pharmacy can always give to patients.
f. In emergencies at night and in the weekends, pharmacies can look into OZIS – the regional network (includes all databases from the pharmacies).
g. Patients have their own pharmacists – like a family pharmacy. It's better to go to their own pharmacy, because pharmacists know everything about their medication - what they are using at the moment and what they have been using. Furthermore, bring many benefits: more protection against drug-related problems; prevents duplication of drugs and drug interactions.

- The access to medication histories through pharmacies is local and in maximum regional. We can say that is "national"? It is not correct, but

it is possible to obtain information from a patient nationwide. For example, if a patient lives in the north of the Netherlands and he's in a hospital in the south, physicians can call or send a fax to the pharmacy from the patient and ask his medication history. Even when we say regional, there's always the problem and challenge to determine where a region starts and what areas it includes. For example, in Breda, they still have a big percentage of patients that are not connected to the system.

- Physicians from hospitals (from all departments) can ask patient's medication information to the community pharmacies via fax or e-mail. But how does a physician identify himself when he wants that information? Regarding this issue the researcher found different answers: the physicians answered that normally they don't have to give their number of registration of healthcare professionals to the pharmacy to get the information; the community pharmacist answered that most of the times they need to send a fax with the signature of the patient.
- Public and Private hospitals can ask patient's medication information to pharmacies also by fax. But the community pharmacy stated that only if the physician sends a fax with the signature of the patient.
- The researcher wanted to understand if the patient sign or not an informed consent. There were different answers regarding this issue, such as: It is not a written informed consent, it is an oral consent given by patients, but physicians have to document in the patients file "patient allows us to ask the pharmacist"; Before the patient visits the hospital pharmacy, we already have the information and at that moment we ask "are we allowed using that information?", etc. There is only one case where the patient signs a document: is when the physicians ask to the pharmacy the patient medication history, because they need to send a fax with the signature of the patient.
- Hospital pharmacists and community pharmacists don't have access to each other's database, but some hospital pharmacists have an agreement with the community pharmacists and they can view the patient's medication data. For example in Breda, they have a pharmaceutical service point but just from the local pharmacies in Breda, where they can access to Pharmacom. That service point is located on a few places in the hospital and only the pharmacy technicians can see that information. If they don't have an agreement

with the community pharmacists, they can look into OZIS. It's an Open Care Information System, a database which can be used by different software systems, and it is read-only.

- When the hospital pharmacist can view Pharmacom, they can print a list of medication from the Community pharmacy. For example, when a patient is going to the hospital (e.g. for a surgery) the technician from the hospital pharmacy get a pre-operative screening of medication using the list of the community pharmacy. Then he asks (or the physician) the patient what kind of medication he is using and checks the list to know exactly what medication the patient is using. So, it is always necessary to check with the patient the medication from the list.
- In November 2011, there was an information campaign in the whole of the Netherlands. Everywhere it was possible to see posters on the wall: "If you go to the doctor, bring your medication list". It was organized by community pharmacists together with hospital pharmacists. The objective was that patients go to their pharmacy and bring their medication history when they visit the hospital. Also important is they check all the medications that they are using to update the information.
- Patients can ask a medication list to the community pharmacist. They also can ask to the family doctor, but usually, they ask to the pharmacy. Pharmacists developed specific lists for specific situations, but usually patients can ask the standard list, which contains the name of the pharmacy, the contra-indications, and intolerances, allergies, the doctor which made the prescription, etc. Another example: when patients are going in holidays, the pharmacies have a specific list (they have this list in Dutch and in English).
- Regarding the kinds of medications that become available on the medication history of patients, usually it is only the medication prescribed and dispensed by the pharmacist. But they always make an effort to record everything they know about medication, also the homeopathic medication and the medication like paracetamol which is not prescribed by a doctor.
- The history of medication also does not contain internal prescriptions (e.g. medications administrated in an emergency episode) and medications dispensed to the patient in the hospital (e.g. when the hospital give for 2 or 3 days medication to overcome the lack of time)
- Hospital and community pharmacists need to keep the medication history for 15 years by law.

- Regarding the information that is available from medication history, they can see the medication in use and the medication history: date of prescription (the date when the medication started); name of the doctor who prescribed (they see the specialty of the doctor but not always the name); the specialty of the doctor who prescribed; the pharmacy who delivered; date of dispending; the dosage; the pharmaceutical form; the amount (how much medication is delivered and how often the patient has to take it); Posology (Indications, if they are put in); medication allergies and contraindications.
- Regarding the LSP – National Switch Point, the objective from the government is to have an electronic patient record, one system for all of the Netherlands, where everybody (healthcare professionals) is connected to. At present, the Ministry of Health has transferred the LSP from NICTIZ to a separate organization called Vereniging van Zorgaanbieders voor Zorgcommunicatie (VZVZ) - Association of Healthcare providers for Healthcare Communications. In November 2012 the VZVZ will start a campaign towards patients to ask their permission to include the patient data in the LSP. Patients should give their authorization until January 1, 2013, otherwise their data are not including on the LSP (but patients may also authorize after that.

5.1 Main Findings

Throughout the questionnaire, the interviews and literature review about other countries, the main findings are:

- Physicians consider that is very important to have access to patient's medication history and this information is essential for patient's diagnosis and treatment.
- The accessibility to patient's medication history through the community pharmacist (medication prescribed by the doctor and medication dispensed by the pharmacy) is essential to have an overview of the history of medication of patients, and can prevent duplication of drugs, drug interactions and could even detect drug-related problems.
- Relating to medication history, it is important that all the medication (prescribed and not prescribed by a physician) should be accessible. In

countries which already have access to medication history, there is always a concern to record all the data for increased patient safety.

- The involvement of pharmacists is crucial: pharmacist is the last health professional to be in contact with the patient before he takes the medication prescribed by the physician. It is the pharmacist who provides all the information and counseling to patients, from drug interactions, contraindications and adverse reactions to the selection of the most appropriate drug.
- In some countries (e.g. Netherlands) campaigns are performed for sensitization of patients. The major objective is "If you go to the doctor, bring your medication list"; because patients should know the medication that they are taking. For such, pharmacies have developed standard lists of medication. Patients should go to their pharmacy (and here we are talking about the concept of family pharmacy) and ask for their current medication list. At this moment it is essential that they check their medication to keep this list updated.
- Even in countries which have systems that allow access to medication history, there is always the need to verify the medication that patients are actually taking.
- Relating with privacy issues, patients are the owners of their own medication history, but it's not very well regulated at this point. Patients should sign an informed consent but in reality they don't sign. For example, in the Netherlands, they are going to start a campaign to inform patients about the LSP (National Switch Point), and how they may authorize the provision of their medical records to be accessible for all healthcare professionals.

5.2 Main Recomendations

Through the questionnaire conducted in Portuguese public hospitals and the interviews carried out in the Netherlands, the researcher is able to make some recommendations.

When we think about create a new system, it is important that it will be as complete as possible. Otherwise we run the risk that users will not use. Using an expression of an interviewee from the Netherlands "I better know nothing than I just know a half of the information".

Regarding this subject – patient's medication history – it is crucial that we have a complete system, with all the medication from the patient: medication prescribed by the physician and dispensed by the pharmacy and medication not subject to medical prescribing, including homeopathic medicines.

But even when we have access to the medication dispensed from the community pharmacies (like in the Netherlands) it is always necessary to check with the patient the current medication.

If we just have access to prescribed medication, we only knows which medication was prescribed, we don't know if the patient he's using that medication. In the other hand, if we have access to medication prescribed by a physician and dispensed by the pharmacy, the patient can buy the medication, but we really don't know if he´s using that or not.

Thus, there are many difficulties in the implementation of a project like this: we have medication which doesn't need to be prescribed by a physician such as the paracetamol and the homeopathic medicines; we have medication that is prescribed by a physician but the patient can or cannot buy that medication; and we have medication prescribed by a physician, but the patient can use or not.

Even with all these difficulties, and taking into account the interviews conducted in the Netherlands and knowledge of the functioning of other systems in other countries the researcher thinks it's very important to have a connection with pharmacies and have access to information about medications dispensed by them. For that to happen there has to be a change of the role of pharmacists in the national health system, because these are the last health professionals to be in contact with the patient before he takes the medication prescribed by the physician. The functions taken by the pharmacist in Portuguese society reflected a growing affirmation that goes beyond its role as a medication technician.

Another possibility is drawing up lists of medication and making them available to patients. The objective would be, as in the Netherlands, encourage Portuguese patients to bring always the medication list with them, when they go for example to an Emergency Department. For that to happen, it will be important to have an institution responsible for the development of this list with the involvement of various health professionals. The patient should be incentive to fill this list with the assistance of a health professional.

It is important to note that during this study was developed in Portugal the PDS – Plataforma de Dados da Saúde, which enables healthcare professionals through Professional Portal, to access prescribed medication history from the last six months. Health professionals also have access to the information recorded by the patient through Users Portal (e.g. medication in use), if the patient has authorized access to that information. However, what happens is most patients are not informed about the Users Portal. Patients do not know what the purpose of this portal and what kind of information may register.

Since there is a solution in Portugal that somehow fulfills the objectives of this study, then the researcher only recommends that it should be improved. Regarding patients, it is crucial to make campaigns of information and awareness regarding the use of the user's portal. Concerning the professional portal, and bearing in mind what has been mentioned throughout this discussion, will be very important the integration of the medication dispensed by pharmacies in this system.

5.3 Limitations

As any other research, this study presented certain limitations. Regarding to the questionnaire conducted at the Portuguese public hospitals, there were several problems that the research could expect.

Like with all web surveys, one of the most worrying threats is that a participant can respond multiple times to the survey. This was a question raised by a hospital that authorized the disclosure of the questionnaire. The researcher explained that the tool used to develop the questionnaire allowed the participant to answer as many times he wished. Another problem with the surveys was the poor response rate. Even with successive contact with the hospitals, the researcher only got 83 responses. The main reasons for the lack of response by some hospitals that authorized the questionnaire were:

- Not all physicians had personal or institutional e-mail
- After approval from the Board of the Hospital, sometimes the researcher was asked to contact the director of the ED to explain the procedures to follow in the release of the questionnaire. After several attempts that seemed not possible.
- Some hospitals required the physical presence of the researcher, which was not possible for her due to the great distances of some of those hospitals.

Regarding to the lack of authorization from the hospitals to carry out the survey, the principal reason had to do with the fact that some institutions have very strict procedures regarding the specific requirements and documentation to conduct studies. As an example, a hospital required that the researcher had one advisor working at that same hospital. In some cases has been requested a declaration that contained the name of research advisors and the curriculum vitae of the researcher.

The process of obtaining permission by the hospitals was very lengthy since it depended on the approval of multiple departments, including the ethics committee, the director of emergency services, the clinical director and the board of directors, among others. For this reason it was necessary to maintain contact with all hospitals, via phone or e-mail, during the period from December 2011 to July 2012, in order to verify in at which point the situation was developing.

The researcher also encountered a problem while receiving the survey responses. The received responses did not show the identification of the respondent (the group number that corresponds to a hospital was not visible). For some nonspecific reason the URL, sent to a hospital, and did not specify what it should have done. It is possible that, in an attempt to access the questionnaire, some participants have copied only part of the URL.

The accomplishment of a complete list with all Portuguese public hospitals was another problem the researcher encountered. Due to several changes in the NHS (the process of converting hospitals into hospital centers or health units, and the fact that some ED's closed down), it was often necessary to update the list of hospitals which was initially considered as the sample.

The inexistence of feedback from some of the interviewees in the Netherlands was also an issue for the researcher since she could not confirm the transcriptions that were carried out and correct the possible mistakes.

The absence of official papers about the PDS to describe the current Portuguese scenario was also one of the limitations that were found. The researcher had to resort to news about the PDS which was sometimes published on websites; some information that was available at the Health Ministry website and SPMS website. The researcher also asked a healthcare professional to explain the professional portal. Regarding the user portal, the researcher entered the website to see how it works. The fact that the researcher had participated in the working group of the PDS (although only a few information sessions and meetings with the development team) has also contributed to a better understanding of the PDS.

References

Barjis, J. (2010). Dutch Electronic Medical Record – Complexity Perspective. *Proceedings of the 43rd Hawaii International Conference on System Sciences*. Hawaii, USA: IEEE Computer Society.

Berkowitz, S. (1997). *Analyse Qualitative Data - Chapter 4*. Retrieved July 31, 2012, from http://www.nsf.gov/pubs/1997/nsf97153/chap_4.htm

Boynton, P., & Greenhalgh, T. (2004). Selecting, designing, and developing your questionnaire. *British Medical Journal, 328*, 1312–5.

Chan, E., Taylor, S., Marriott, J., & Barger, B. (2009). Bringing patients' own medication into an emergency department by ambulence: effect on prescribing accuracy when this patients are admitted to the hospital. *The Medical Journal of Australia, 191*(7), 374-377.

CRRNEU. (2012). *Relatório*. Portugal: Comissão de Reavaliação da Rede Nacional de Emergência e Urgência.

Department of Health Policy. (2009). Select Examples of Exchange in Other Developed Countries.

EOHSP. (2011). Heath Systems in Transition - Portugal: Health system review. European Observatory on Health Systems and Policies.

FitzGerald, R. (2009). Medication Errors: The importance of an accurate drug history. *British Jornal of Clinical Pharmacology, 67*(6), 671-675.

Gomes, J. (2009). MedQuest - Um Projecto de Questionário Web na Área da Saúde. *Mestrado em Informática Médica*.

Healthcare Professional. (2012, October). Plataforma de Dados da Saúde - Portal Profissional. (M. David, Interviewer)

i-GOV. (2012, October). *Plataforma de Dados de Saúde abre as portas ao profissional de saúde*. Retrieved from http://www.i-gov.org/index.php?article=18209&visual=1&id=217&subject=332

INFARMED. (2012, September). *Autoridade Nacional do Medicamento e Produtos de Saúde*. Retrieved from http://www.infarmed.pt/portal/page/portal/INFARMED

Miles, M., & Huberman, A. (1994). *Qualitative Data Analysis*. Sage Publications.

Ministério da Saúde. (2005, Agosto 16). Decreto-Lei n.º 134/2005.

Ministério da Saúde. (2011, Maio 18). *Portaria n.º 198/2011*.

Ministério da Saúde. (2012, September). Retrieved from A. Questões de âmbito geral sobre Prescrição Electrónica de Medicamentos (PEM): http://www.acss.min-saude.pt/Portals/0/FAQ_Pem.pdf

Ministério da Saúde. (2012, October). Retrieved from Manual de Acesso a Serviços: https://servicos.min-saude.pt/acesso/faces/faces/ManualAcesso.jsf

Ministério da Saúde. (2012, October). Retrieved from https://servicos.min-saude.pt/acesso/faces/Login.jsp

Ministério da Saúde. (2012, October). *Access in the Users Portal*. Retrieved from https://servicos.min-saude.pt/acesso/faces/Login.jsp

Ministério da Saúde. (2012, July 31). *Mapa Hospitais EPE*. Retrieved from http://www.hospitaisepe.min-saude.pt/Hospitais_EPE/Mapa_Hospitais/

NICTIZ. (2008). *eHealth in the Netherlands - Policies, developments and status of cross-enterprise information exchange in Dutch healthcare*. The Netherlands.

Paterson , J., Suleiman, A., Hux, J., & Bell, C. (2008). How complete are drug history profiles that are based on public drug benefit claims? *Can J Clin Pharmacol, 15*(1), 108-116.

Pirnejad, H., Bal, R., Stoop, A., & Berg, M. (2007, May 16). Inter-organisational communication networks in healthcare: centralised versus decentralised approaches. *International Journal of Integrated Care, 7*, 1-12.

Portal da Saúde. (2012, October). *PDS/PHR - Plataforma de Dados de Saúde*. Retrieved from http://www.min-saude.pt/portal/conteudos/a+saude+em+portugal/informatizacao/PDSenglishm.htm

Portal da Saúde. (2012, September). *Prescrição electrónica de medicamentos*. Retrieved from http://www.portaldasaude.pt/portal/conteudos/informacoes+uteis/medicamentos/prescricao+electronica.htm

Protti, D. (2007). Moving toward a single comprehensive electronic health record for every citizen in Andalucía, Spain. *Healthcare Quaterly, 10*(4), 114-123.

Rattray, J., & Jones, M. (2007). Essential elements of questionnaire design and development. *Journal of Clinical Nursing, 16*, 234–243.

Simonaitis, L., Belsito, A., & Overhage, J. (2008). Enhancing an Eprescribing System By Adding Medication Histories and Formularies: the Regenstrief Medication Hub. In A. M. Association (Ed.), *AMIA Symposium Proceedings*, (pp. 677-681).

Suárez-Varela, U., Beltrán Calvo, C., Molina López, T., & Navarro Marín, T. (2005). [Computer-aided prescribing: from utopia to reality]. *Atención Primaria, 35*(9), 451-456.

Tam, V., Knowles, S., Cornish, P., Fine, N., Marchesano, R., & Etchells, E. (2005). Frequency, type and clinical importance of medication history errors at admission to hospital: a sistematic review. *Canadian Medical Association Journal, 173*(5), 510-515.

VZVZ. (2012, October 29). *Vereniging van Zorgaanbieders voor Zorgcommunicatie*. Retrieved from http://www.vzvz.nl

Wyatt, J. (2010). When to use Web-based Surveys. *Journal of the American Medical Informatics Association, 7*(4), 426-430.

Appendix

Appendix I

List of Portuguese Public Hospitals with more detail

Total	Region	Abbreviation	Name of the Hospital	Notes
1	**North**	ULSM	Unidade Local de Saúde de Matosinhos, EPE - Hospital Pedro Hispano	The ULSM consists of the following units of care: Cluster Health Centers of Matosinhos - ACES; Hospital Pedro Hispano - HPH and Convalescent Unit.
2	**North**	HSJ	Hospital de São João, EPE	Hospital de São João and Hospital Nossa Senhora da Conceição de Valongo merged at Centro Hospitalar de São João (CHSJ, EPE).
3	**North**	ULS	**Unidade Local de Saúde do Nordeste**	
			Unidade Hospitalar Bragança	
			Unidade Hospitalar Macedo de Cavaleiros	
			Unidade Hospitalar Mirandela	
4	**North**	CHTMAD	Centro Hospitalar de Trás-os-Montes e Alto Douro, EPE	O CHTMAD, E.P.E was created on 28/02/07, by fusing the Centro Hospitalar de Vila Real/Peso da Régua, E.P.E and the Hospital Distrital de Chaves e o Hospital Distrital de Lamego
5	**North**	CHAA	Centro Hospitalar do Alto Ave, EPE	Fusion of Hospital da Senhora da Oliveira and S. José de Fafe.
6	**North**	ULSAM	**Unidade Local de Saúde do Alto Minho, EPE**	
			Hospital de Santa Luzia	
			Hospital do Conde de Bertiandos	
7	**North**	CHP	Centro Hospitalar do Porto, EPE	
8	**North**	CHVNG/E	Centro Hospitalar de Vila Nova de Gaia/Espinho	
9	**North**	CHTS	**Centro Hospitalar do Tâmega e Sousa, EPE**	
			Padre Américo	
			S. Gonçalo	
10	**North**	HSMM	Hospital Santa Maria Maior, EPE (Barcelos)	

Total	Region	Abbreviation	Name of the Hospital	Notes
11	**North**	CHMA	**Centro Hospitalar do Médio Ave, EPE**	
			Unidade de Santo Tirso	
			Unidade de Famalicão	
12	**North**	CHPVVC	**Centro Hospitalar Póvoa de Varzim-Vila do Conde**	
			Unidade da Póvoa de Varzim	
			Unidade de Vila do Conde	
13	**North**	HB	Hospital Braga	The Hospital de Braga is a hospital unit is integrated into the NHS, under a Public Private Partnership celebrated through a management contract signed by the Northern Regional Health Authority, representing the Ministry of Health.
14	**Center**	HIP	Hospital Infante D. Pedro - Aveiro	The Centro Hospitalar do Baixo Vouga, EPE was created on 01.04.2011 by merger of Hospital Infante D. Pedro E. P. E., Hospital Visconde Salreu from Estarreja and the Hospital Distrital de Águeda of Aveiro (Decree-Law n. º 30/2011 of 2 March). However, the request for disclosure of the questionnaire was done for each individual Board. The Hospital Estarreja was not considered because he has no ED since 2009.
15	**Center**	HDA	Hospital Distrital de Águeda	
16	**Center**	HDFF	Hospital Distrital da Figueira da Foz, EPE	
17	**Center**	CHCB	Centro Hospitalar Cova da Beira, EPE	
18	**Center**	CHEDV	**Centro Hospitalar de Entre o Douro e Vouga, E.P.E.**	
			Hospital de São Sebastião	
			Hospital de São João da Madeira	
			Hospital São Miguel	

Total	Region	Abbreviation	Name of the Hospital	Notes
19	**Center**	CHLP	Centro Hospitalar Leiria-Pombal	
20	**Center**	CHTV	**Centro Hospitalar Tondela-Viseu, EPE**	
			Hospital de São Teotónio (Viseu)	
			Hospital Cândido de Figueiredo (Tondela)	
21	**Center**	CHUC	Centro Hospitalar e Universitário de Coimbra	
22	**Center**	ULSCB	Unidade Local de Saúde (ULS) de Castelo Branco, E.P.E.	
23	**Center**	ULSGuarda	Unidade Local de Saúde da Guarda, E. P. E.	
			Hospital Nossa Senhora da Assunção - Seia	
			Hospital Sousa Martins - Guarda	
24	**Lisboa and Vale do Tejo**	HFF	Hospital Professor Doutor Fernando Fonseca, EPE	
25	**Lisboa and Vale do Tejo**	CHLC	**Centro Hospitalar de Lisboa Central, EPE**	
			Hospital de S. José	
			Hospital de Santo António dos Capuchos	
			Hospital de Santa Marta	
			Hospital Dona Estefânia	
26	**Lisboa and Vale do Tejo**	CHLO	**Centro Hospitalar de Lisboa Ocidental, E.P.E.**	
			Hospital de Egas Moniz	
			Hospital de Santa Cruz	
			Hospital de S. Francisco Xavier	

Total	Region	Abbreviation	Name of the Hospital	Notes
27	**Lisboa and Vale do Tejo**	CHLN	**Centro Hospitalar Lisboa Norte**	
			Hospital de Santa Maria	
			Hospital de Pulido Valente	
28	**Lisboa and Vale do Tejo**	CHMT	**Centro Hospitalar do Médio Tejo, EPE**	
			Unidade de Abrantes - Hospital Doutor Manoel Constâncio	
			Unidade de Tomar - Hospital Nossa Senhora da Graça	
			Unidade de Torres Novas - Hospital Rainha Santa Isabel	
29	**Lisboa and Vale do Tejo**	HGO	Hospital Garcia de Orta, EPE	
30	**Lisboa and Vale do Tejo**	CHBM	**Centro Hospitalar Barreiro Montijo, EPE**	
			Hospital de Nossa Senhora do Rosário - Hospital Distrital do Barreiro	
			Hospital Distrital do Montijo	
31	**Lisboa and Vale do Tejo**	HDS	Hospital Distrital de Santarém, EPE	
32	**Lisboa and Vale do Tejo**	CHS	**Centro Hospitalar de Setúbal, E.P.E.**	
			Hospital de São Bernardo	
			Hospital Ortopédico Sant'Iago do Outão	
33	**Lisboa and Vale do Tejo**	CHON	**Centro Hospitalar do Oeste Norte**	
			Centro Hospitalar Caldas da Rainha (Hospital Distrital Caldas da Rainha; Hospital Termal Rainha D. Leonor)	
			Hospital São Pedro Gonçalves Telmo - Peniche	
			Hospital Bernardino Lopes de Oliveira - Alcobaça	
34	**Lisboa and Vale do Tejo**	HRS	Hospital de Reynaldo dos Santos - Vila Franca de Xira	

Total	Region	Abbreviation	Name of the Hospital	Notes
35	**Lisboa and Vale do Tejo**	HBeatrizAngelo	Hospital Beatriz Ângelo	The Hospital Beatriz Angelo is a new public hospital, built in the National Health Service.
36	**Alentejo**	ULSBA	**Unidade Local de Saúde do Baixo Alentejo, EPE**	
			Hospital José Joaquim Fernandes (Beja)	
			Hospital de São Paulo (Serpa)	
37	**Alentejo**	ULSNA	**Unidade Local de Saúde do Norte Alentejano, E.P.E.**	
			Hospital Dr. José Maria Grande de Portalegre	
			Hospital de Santa Luzia de Elvas	
38	**Alentejo**	HESE	Hospital do Espírito Santo de Évora, EPE	
39	**Alentejo**	HLA	Hospital do Litoral Alentejano, EPE	
40	**Algarve**	CHBA	Centro Hospitalar do Barlavento Algarvio, EPE - Unidade Hospitalar de Portimão (sede)	The CHBA is formed by two hospital units: Portimão and Lagos. The questionnaire was made available only to Portimão.
41	**Algarve**	HDF	Hospital de Faro, EPE	

	Authorized
	Authorized but outside the deadline (July 31, 2012)
	Not authorized

Appendix II

Formal requirement for questionnaire authorization

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Exmo. Senhor Presidente do Conselho de Administração da
……..

Porto, dia… de …… de 2012

Assunto: "Acessibilidade nos Serviços de Urgência ao Histórico de Medicamentos dos Doentes".
Questionário de opinião no âmbito da investigação para Tese de Mestrado em Informática Médica, a desenvolver na Faculdade de Medicina e Faculdade de Ciências da Universidade do Porto.

Diversos estudos têm demonstrado que a morbilidade e mortalidade associada aos medicamentos são muito elevadas. Os erros de medicação, em especial nos Serviços de Urgência/Emergência, constituem um dos problemas que tem preocupado as autoridades sanitárias de alguns países desenvolvidos, e que os levou a repensar e redesenhar os seus processos clínicos, para melhorar o atendimento e segurança dos doentes. A maioria dos erros de medicação e de intervenções inapropriadas é imputável a uma história incompleta da medicação, no momento da admissão do doente nos Serviços de Urgência/Emergência.
No seguimento do acima exposto, venho solicitar a V. Exa. permissão e apoio na divulgação pelos profissionais médicos do Serviço de Urgência de ……., de um questionário de opinião cujo preenchimento se afigura essencial para o sucesso da tese acima identificada.
Neste sentido venho requerer que:

a. O questionário acima mencionado seja disponibilizado a todos os profissionais médicos do Serviço de Urgência (médicos de clínica geral e médicos especialistas, incluindo internos do ano comum e internos complementares)
b. O questionário seja disponibilizado via *online pelos V. Serviços*, enviando o respectivo *link* para o e-mail dos mesmos.
c. Me seja facultado o número total de profissionais a quem será dado acesso o questionário.

Informo que todos os dados serão tratados de forma completamente anónima. No final do estudo será enviado um resumo dos resultados obtidos.
Em anexo envio declaração comprovativa de frequência de Mestrado em Informática Médica, Proposta de Tese, Questionário a disponibilizar aos profissionais de saúde e pequeno texto explicativo do objectivo de preenchimento do questionário a agregar ao *link* disponibilizado.

Estando certa que o tema desta investigação será de maior interesse para a V. Instituição, aguardo a melhor apreciação por parte de V. Exa.

Atentamente,

_____

Appendix III

Questionnaire

O meu nome é Margarida David e sou estudante do Mestrado em Informática Médica, na Faculdade de Medicina e Faculdade de Ciências da Universidade do Porto. Estou a desenvolver a investigação para a respectiva Tese de Mestrado, com o tema "Acessibilidade nos Serviços de Urgência ao Histórico de Medicamentos dos Doentes".
Um dos objectivos deste estudo é aferir a importância do acesso ao histórico de medicação dos doentes nos serviços de urgência, na diminuição de erros de medicação e de intervenções inapropriadas.
Assim, foi elaborado o seguinte questionário que será disponibilizado a todos os médicos que exercem funções nos serviços de urgência dos hospitais públicos portugueses.
A resposta a este questionário demora cerca de 5 minutos e é extremamente importante para o desenvolvimento de uma aplicação informática que seria pioneira em Portugal.
Agradeço desde já a sua participação e colaboração.

Informação Pessoal e Profissional

1. Sexo
- ○ Masculino
- ○ Feminino

2. Idade
- ○ Menos de 30 anos
- ○ Entre 31 e 40 anos
- ○ Entre 41 e 50 anos
- ○ Entre 51 e 60 anos
- ○ Mais de 61 anos

3. Enquadramento na Carreira Médica
- ○ Especialista
- ○ Interno complementar
- ○ Interno do ano comum

4. Especialidade Médica

4.1. Se respondeu "Outra" na questão anterior, por favor especifique a sua especialidade.

5. Para além do Serviço de Urgência, indique em que instituições desempenha funções.
- ☐ Centro de Saúde
- ☐ Hospital Privado
- ☐ Hospital Público
- ☐ Clínica Privada

6. Indique o número de horas mensal que desempenha funções nos serviços de urgência.
- ○ Menos de 10 horas
- ○ Entre 11 e 20 horas
- ○ Mais de 21 horas

[Sair] [Ajudas] Gravar

MedQuest Recolha

Colecção 41

NOVO

Acessibilidade nos Serviços de Urgência ao Histórico de Medicação dos Doentes

A sua experiência e opinião:

7. Num episódio de Urgência, com que frequência procura saber o histórico de medicação do doente?	○ Sempre ○ Muito frequentemente ○ Com alguma frequência ○ Raramente ○ Nunca
8. Para uma melhor prestação de cuidados, a acessibilidade no Serviço de Urgência, ao histórico de medicação dos doentes é:	○ Irrelevante ○ Pouco Importante ○ Importante ○ Muito Importante ○ Determinante

9. Na sua opinião, que benefícios teria se tivesse acesso nos Serviços de Urgência ao histórico de medicação dos doentes.

Por favor responda à questão utilizando a seguinte escala: 1=Discordo totalmente; 2=Discordo; 3=Indiferente; 4=Concordo; 5=Concordo totalmente

9.1.Caracterização mais rápida da situação	○ 1 ○ 2 ○ 3 ○ 4 ○ 5
9.2. Diagnóstico mais rápido	○ 1 ○ 2 ○ 3 ○ 4 ○ 5
9.3. Melhor diagnóstico	○ 1 ○ 2 ○ 3 ○ 4 ○ 5
9.4. Terapêutica mais adequada	○ 1 ○ 2 ○ 3 ○ 4 ○ 5
9.5. Rapidez na Terapêutica	○ 1 ○ 2 ○ 3 ○ 4 ○ 5
9.6. Melhor Prognóstico	○ 1 ○ 2 ○ 3 ○ 4 ○ 5
9.7. Benefício económico	○ 1 ○ 2 ○ 3 ○ 4 ○ 5

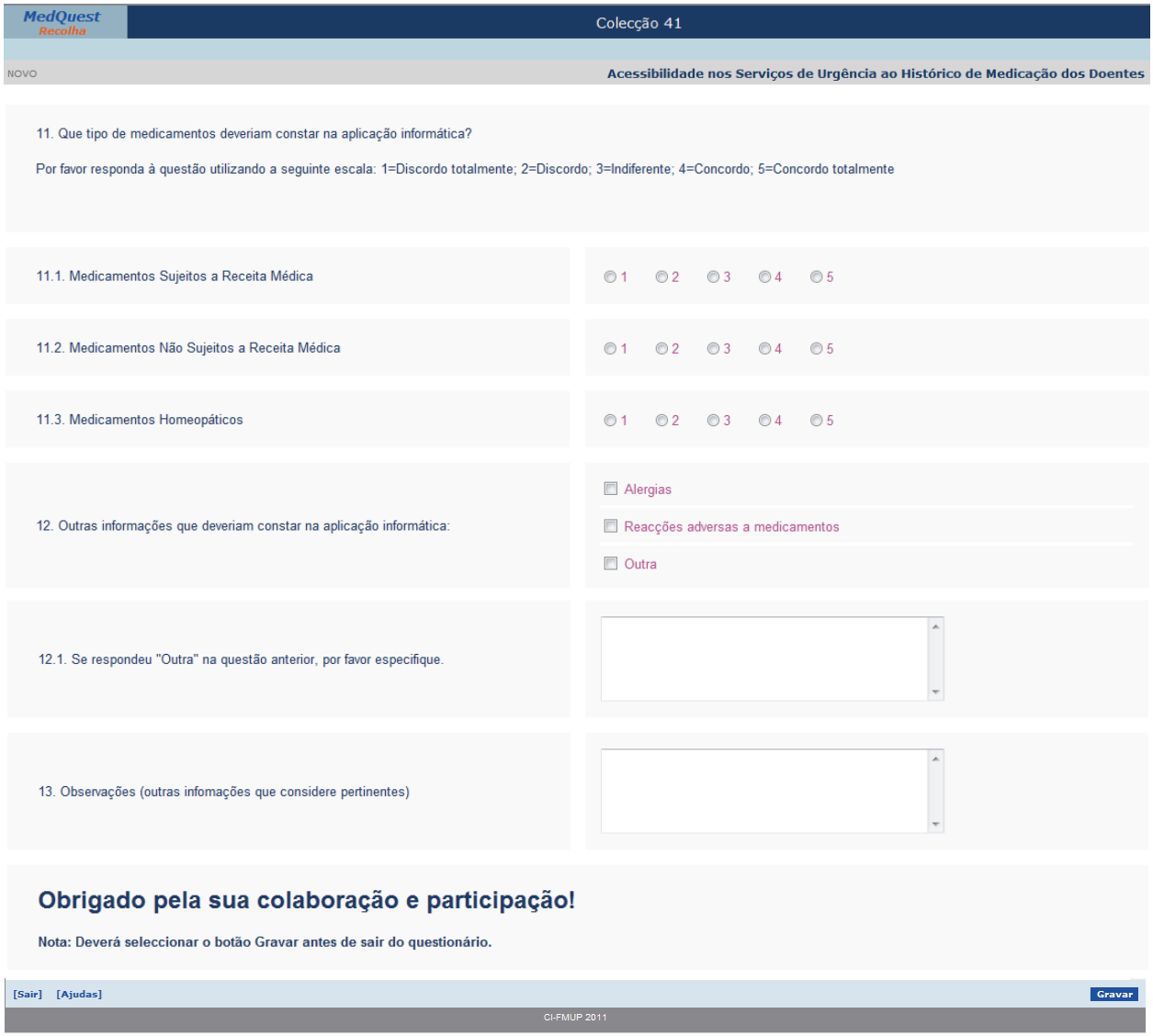
[Sair] [Ajudas] Gravar

CI-FMUP 2011

10. Num cenário de urgência, a que informações acha que deveria poder aceder numa aplicação informática com o histórico de medicação dos doentes?

- [ ] Local da Prescrição
- [ ] Data da Prescrição
- [ ] Nome do médico que prescreveu
- [ ] Especialidade do médico que prescreveu
- [ ] Contacto telefónico do médico que prescreveu
- [ ] Nome da Farmácia que dispensou os medicamentos
- [ ] Contacto da Farmácia que dispensou os medicamentos
- [ ] Data da dispensa dos medicamentos
- [ ] Nome do doente
- [ ] Data de Nascimento do doente
- [ ] Morada do Doente
- [ ] Contacto telefónico do doente
- [ ] Número de identificação civil do doente
- [ ] Número de identificação fiscal do doente
- [ ] Número de Utente do SNS do doente
- [ ] Número de Beneficiário do doente
- [ ] Entidade Responsável do Sistema de Saúde (e.g. SNS, ADSE, etc.)
- [ ] Regime Especial de Comparticipação de Medicamentos
- [ ] Designação do medicamento (e.g. Mebeverina [Duspatal Retard])
- [ ] Dosagem do medicamento (e.g. 200mg)
- [ ] Forma Farmacêutica do medicamento (e.g. Cáps. libert. prolong., Blister)
- [ ] Dimensão da embalagem (e.g. 30 unidades)
- [ ] Número de embalagens prescritas
- [ ] Posologia indicada
- [ ] Autorização de medicamento genérico
- [ ] Não autorização de medicamento genérico
- [ ] Outra

10.1. Se respondeu "Outra" na questão anterior, por favor especifique.


MedQuest
Recolha
Colecção 41
NOVO
Acessibilidade nos Serviços de Urgência ao Histórico de Medicação dos Doentes
11. Que tipo de medicamentos deveriam constar na aplicação informática?
Por favor responda à questão utilizando a seguinte escala: 1=Discordo totalmente; 2=Discordo; 3=Indiferente; 4=Concordo; 5=Concordo totalmente
11.1. Medicamentos Sujeitos a Receita Médica
1 2 3 4 5
11.2. Medicamentos Não Sujeitos a Receita Médica
1 2 3 4 5
11.3. Medicamentos Homeopáticos
1 2 3 4 5
12. Outras informações que deveriam constar na aplicação informática:
Alergias
Reacções adversas a medicamentos
Outra
12.1. Se respondeu "Outra" na questão anterior, por favor especifique.
13. Observações (outras infomações que considere pertinentes)
Obrigado pela sua colaboração e participação!
Nota: Deverá seleccionar o botão Gravar antes de sair do questionário.
[Sair] [Ajudas]
Gravar
CI-FMUP 2011

Appendix IV

Article submitted for the 4th Medical Informatic's Symposium, 2011

Accessibility in the Emergency Department to patient's medication history

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Keywords - Drug Prescriptions; Electronic Prescribing ; Medical History Taking ; Community Pharmacy Services; Medication Errors; Drug Interactions

I. INTRODUCTION

Medication errors are a major concern in the Emergency Department in all countries. The most part of the hospital medication prescribing errors are attributable to incomplete medical histories at the moment a patient is admitted in the ED.[1]

The process of keeping a medication history begins when the physician asks the patients (if the patient can respond) what kind of prescribed medication they are taking. The collected data is often inaccurate because the patient rarely knows the exact names and doses of their current and recent prescriptions, or they just describe the color and characteristics of the pill or medication box.

An accurate medication history gives more knowledge of the drugs that the patient takes or has taken, and prevents duplication of drugs, drug interactions and could even detect drug-related problems.[2]

Many organizations in many countries have already begun to redesign their clinical processes to improve the patient's care and safety. One strategy to minimize the possible problems with medication is having electronic access to the patient's medication history, through databases from national community pharmacies. In this way, physicians have knowledge about what, when and how much medication was dispensed from the pharmacy to the patient.

For example, in Ontario, one of the provinces of Canada, the Ministry of Health and Long-Term Care provided most Ontario hospital ED's with electronic access to the medication history of patients, through the Ontario Drug Benefit program (ODB). The physicians from the ED's are allowed to access a patient's medication history in real-time. The major objective of this system is to help healthcare providers to quickly identify and prevent drug reactions, and provide more informed emergency care. [3]

In Portugal the scenario is quite different. All Portuguese pharmacies are equipped with computer networks and specific software which is properly accredited.[4] One of the pharmacies' software applications used in Portugal allows the pharmacies, to consult the medication history of their customers. All the data is centralized in the ANF – Portuguese National Association of Pharmacies, in a non-word mark, a barcode. The ANF only has access to the customers' barcode, without any possibility of identification.[5,6] . None of the health organizations or physicians has access to the patients' medication histories in Portugal.

Recently the Portuguese government introduced the requirement of the electronic prescription. This will create a better communication between professionals from different institutions, since there is one uniform format of information that is exchanged. It will also decrease the risk of errors in prescriptions.

II. AIM

To develop an application that allows the ED's in the public Portuguese hospitals real-time access of patients' medication histories. Subsequently a pilot project will be implemented in an ED.

III. METHODS

A literature review will be done to understand the operational aspects of the existing applications in other countries. Besides this, a questionnaire will be sent to all the ED's of the public portuguese hospitals. With the questionnaire it will be possible to measure the importance of access to patients' medication histories in the reduction of medication errors and inappropriate interventions.

Also crucial to this study will be the interviews which will be held with several Portuguese health institutions, like: ANF - National Pharmacy Association, ACSS - Central Health Administration System, ARS - Regional Health Administration and others.

IV. EXPECTED RESULTS

After a thorough research on existing applications in other countries, and the development of an application suitable for Portugal, the expectation is the implementation of a pilot project in one ED. The results of this pilot project will be compared with the situation before the implementation of the application. This will be thoroughly evaluated and validated, using the most appropriate methods of statistical analysis.

REFERENCES

[1] Tam VC, Knowles SR, Cornish PL, et al. Frequency, type and clinical importance of medication history errors at admission to hospital: a systematic review. *CMAJ*. 2005;173(5):510-515.

[2] FitzGerald RJ. Medication errors: the importance of an accurate drug history. *Br J Clin Pharmacol*. 2009;67(6):671-675.

[3] Paterson JM, Suleiman A, Hux JE, Bell C. How complete are drug history profiles that are based on public drug benefit claims? *Can J Clin Pharmacol*. 2008;15(1):e108-116.

[4] Deliberação n.º 292/2005, February 17 2005; (DR II.ª Série, n.º 46, 07/02/05)

[5] Deliberação n.º 292/2005, February 17 2005; (DR II.ª Série, n.º 46, 07/02/05)

[6] CNPD – Comissão Nacional de Protecção de Dados; Autorização n.º 172/2007 , February 5 2007

Appendix V

Question List (interviews in the Netherlands)

Question list

1. By what way do pharmacies allow access to a patient's medication history?
    a. Via telephone
    b. Via fax
    c. Via email
    d. Via software application accessed in real time
    e. Other

2. If the access to medication histories is through a computer application:
    a. All pharmacies use the same software?
    b. Is there an institution in the Netherlands that certifies the software used in the pharmacies?

3. The access to medication histories through pharmacies is:
    a. National
    b. Regional
    c. Local

4. Patients signed informed consent form? With whom (pharmacies?)

5. How does a physician identify himself when he wants to access information from the patient's medication history:
    a. Number of registration of healthcare professionals)(N BIG-nummer)
    b. Name
    c. Other

6. By what way can the patient's medication history be accessed?
    a. Health number
    b. Number of civil identification
    c. Full name
    d. Date of birth
    e. Address
    f. Other

7. Who can access the patient information?
    a. Pharmacies
    b. Physicians (specify functions which they perform in the hospital)
    c. Nurses
    d. Patients
    e. Other

8. If the patient has access to your medication history, how can obtain it?
    a. Identification (Citizen Service Number (BSN)?
    b. To who can request this information?

9. Institutions in which information can be accessed:
    a. Public hospitals
    b. Private hospitals

10. Which departments in a hospital are allowed to access information from patient's medication histories:
    a. Emergency department
    b. Intensive care
    c. Internment
    d. External consultation (include here family doctor)
    e. Surgery
    f. Others

11. What kinds of medications become available on the medication history of patients:
    a. Prescribed by a doctor
    b. Medicines not subject to medical prescription
    c. Homeopathic medicines
    d. Are there exceptions? (e.g. HIV drugs)

12. For how long the medication history is kept:
    a. Years (how many)
    b. The last year
    c. Months
    d. Other

13. The medication history is accessed through pharmacies (medications dispensed by the pharmacy). The history of medication does not contain more information, like:
    a. Internal Prescription – e.g. medications prescribed and administered in the emergency
    b. Medications dispensed to the patient in the hospital - e.g. in ambulatory surgery, the patient often takes with him medication dispensed by the hospital

14. Which information is available regarding the medication history?
    a. Location Prescription
    b. Date of Prescription
    c. Name of doctor who prescribed
    d. Specialty of the doctor who prescribed
    e. Telephone number of the physician who prescribed
    f. Date of dispensing of medications at the pharmacy
    g. Designation of the medicinal **(Omschrijving/beschrijving van het medicament) (Paracetamol/Codeinefosfaat Sandoz)**
    h. Dosage **(dosering) (paracetamol 500mg, codeinefosfaat-hemihydraat 20mg)**
    i. Pharmaceutical form **(toedieningsvorm) (voor oral gebruik)**
    j. Amount of tablets **(aantal tabletten) (30 tabletten)**
    k. Posology **(dosering)(3 a 4 daags 1 tablet)**
    l. Medication allergies **(medicijnallergieën)**
    m. Other

Other subjects:

a. Family doctor and family pharmacist
b. E-prescribing in the Netherlands
c. Electronic Health Record (electronic medication record (EMD) and electronic general practitioner's summary file to be used by locum GP's).
d. Institutions involved with implementing of e-prescribing and Electronic Health Record (Nictiz – national IT institute for healthcare; Ministry of Health; others)

Appendix VI

Interviews transcriptions from the Netherlands

Interview with Dr. Marc Jonkers & Dr. Anthon Hulsmann - Pediatricians
Amphia Ziekenhuis, Breda
November 7, 2011

MJ: Marc Jonkers
AH: Anthon Hulsmann
M: Margarida David
B: Bart Wouters (interpreter)

Notes:
1. **The interview was tape-recorded with the authorization of the interviewees and the interpreter.**
2. **Before the interview started, we had the opportunity to visit the Pediatrics Department through a guided tour.**

M: I´m writing a thesis for my master and the subject is to design an informatic application to have access to patient medication history in Portugal, especially in the emergency department. This is why I would like to understand the reality of this subject in other countries.

MJ: In the Netherlands, the electronic prescribing is going to start in the next summer (2012).

M: So at present you prescribe by hand?

MJ: Yes, right now we write the recipe by hand. The GP's (General Practitioners) are much more developed in this sense; they prescribe electronically since many years.

M: Ok, I thought it was an obligation by law in the Netherlands. In Portugal we started with electronic prescribing in last august (2011).

MJ: And it's by law?

M: Yes. It is a phase of transition and so we still have some exceptions. For example, for the doctors who make house calls, they write the recipe by hand. They are not obligated to prescribe electronically.

MJ: In the Netherlands it is not an obligation to prescribe electronically, not by law. In reality, the family doctors prescribe mainly electronically, by e-prescribing. We are not using it yet but we plan to do that next summer (2012).

B: Family doctors all do that?

MJ: Yes, nearly all the GP's do that, but they can still prescribe by hand. For example, my wife is a family doctor and she prescribes by hand when she's doing house visits but when she comes back to her officer she will put all those prescriptions in the computer. So the record is complete.
There are hospitals in the Netherlands that prescribe electronically already, but here we don't do that yet. The GP's prescribe electronically and they have two different programs, one of them is Medicom. Medicom is from Pharmapartners.

B: And a system like this is going to be use in the entire hospital or just in the Child Department?

MJ: No, it's in the whole hospital. We have one system but there are different modules for each department.

B: Yes, because they need their own specific layout…

MJ: Yes, it's right.

AH: But one of the problems is that the layout of the patients who are admitted in the hospital is completely different from the layout for patients who are outpatients. The process is more or less the same. So that's typical…

MJ: Yes, you have different buttons, you have different layouts and the layout changes after you click the button.
Now we are going to install the software EPIC in the whole hospital. EPIC is from the United States and they are marktleader in that business. That system is being used in more than 160 hospitals in the United States and they just started in Europe. They are now in three hospitals in Europe and those are three Dutch hospitals. One is in Haarlem and another is the Lukas Andreas Hospital in Amsterdam we are the third one. And they want to expand to more hospitals in Europe after they have developed the software for the Dutch hospitals.

M: About my question list…

MJ: Yes, we can start…But because we don't prescribe electronically yet, it is a bit premature for us to answer some questions…

M: That's ok. First of all, I would like to confirm if in the Emergency Department the physicians can call to the pharmacy to ask the medication that the patient is using?

MJ: Yes, that's correct. We can call to the pharmacy but it depends on the fact if the medication is prescribed by the General Practitioner. They have the communication between the family doctor and the local pharmacy, in the cities. If the family doctor is entering the medication in the computer the pharmacy can see it as well, so they can see both. But in the hospital we cannot look directly in their system to see the medication that the patient is using, just if we call to the pharmacy during the daytime. So the pharmacy keeps track on the medication and the GP's do too, but we don't. Our hospital enters the medication in the computer and the medication that is written by hand is entered in the computer by the pharmacy assistants. Every morning they go hospital ward and they enter all the hand written prescriptions they find there in the computer. So we can see what the patient is using. But it is only for tracking and not for prescribing.

M: But you are talking about the medication that is administered here in the hospital? But if you need to know the medication the patient is using you need to call to the pharmacy, is that?

MJ: Yes, if it is prescribed medication from the family doctor it is not available in our system. There's no communication between the two systems.

M: And if the patient is here in this hospital (Breda), but is living Amsterdam for example. You can call to a pharmacy in Amsterdam?

MJ: Yes, we can call to the pharmacy. But there's no electronically communication yet. There is a political debate on the subject that we can see the patient's medical records from other hospitals but it is not

allowed by the politicians yet because it is not safe. The security of the data is more important than having communication between the different systems. They want to make one access point in the Netherlands where all the medical data will go, but for now it is not safe enough. We are thinking now about communicating by an electronically standard. We have an electronic medical record like this and it can communicate with the hospital in Amsterdam, for example. So, it will be direct communication instead of all the data going to one point…

M: You talking about the National Switch Point?

MJ: Yes and the National Switch Point is not safe so we do direct communication.

M: But do you think they are not going to make that through the National Switch Point in the Netherlands?

MJ: No, the National Switch Point is not going to start in the next years, we think. The doctors they want to have this, of course, but the politicians don't consider it safe enough.

AH: It is not allowed in the Netherlands because medical data is secret and there probably will be no solutions for these safety and privacy issues in the next years.

M: I was reading about the patients' rights regarding to the National Switch Point…about the informed consent that the patient should sign…like he has the right to delete information from his file, or choose which physicians can see his file…

MJ: If you send medication to another organization then you need informed consent of course. That is one of the problems on safety. You have to give consent actively when the medication is sending somewhere else, and they are really afraid to do that. But if a patient, for example from Amsterdam, is knocking on the Emergency door here, saying "please help", at this moment we don't have information on his medical record. So I think is probably better, if you are part of the team who treats patients, you can directly contact electronically the medical records in the hospital of Amsterdam. In this scenario we are one team so the patient doesn't have to give informed consent in that Emergency visit because everything is one team of treatment. If the patient comes to the hospital we can ask if we can see his medical records in Amsterdam. He then will give permission at that time and we contact electronically the hospital in Amsterdam. Like this we don't need the National Switch Point.

M: But right now you're not working in that way? That is in the future?

MJ: No, we are not working like that now. But with the EPIC system it is possible to communicate between the hospitals. They are using that in the United States.

M: Yes, I understand, but for that you need to have the EPIC in all of the hospitals in the Netherlands…

MJ: Or you need a standard. If you have a standard way of communicating you can read the data from all the hospitals. And EPIC can read and can deliver the standard.

M: To conclude, you can ask the medication history from a patient through phone, fax or e-mail (question number 1).

MJ: Yes, that's correct.

M: If the access to medication histories is through a computer application, do all pharmacies in the Netherlands use the same software? (Question number 2)

MJ: I'm maybe not the right person to answer that question; I think it is better if you ask this to a pharmacist. What I know is that Medicom is communicating directly with the GP's. For us (pediatricians) it is important that our system can communicate with the systems of the pharmacies and the family doctors.

M: We already talked about the question number 3 (The access to medication histories through pharmacies is national, local or regional?). For example, if a patient is here in the hospital but he's from Amsterdam, and you need to know the medication that he's using you can call…

MJ: Yes, but it is only in daytime, it is only in office hours.

M: And at night?

MJ: We can call to the hospitals, it's what we do. Because we cannot reach the pharmacy.

M: But if you call to the hospitals you can have access to the medication history?

MJ: Only the medication that is prescribed in the hospital. Not the medication from outpatients. We don't have communication between hospitals and local pharmacies yet.

M: We already talked about the informed consent which the patient should give (question number 4) but it was not completely clear to me. If you are allowed to call to a pharmacy to ask the patients medication history, the patient should give the informed consent before that.

MJ: Yes, in reality we ask the patients if we can call to the pharmacy. And we only call to the pharmacy if they approve. It is not a written informed consent, it is an oral consent.

M: So the patients don't sign anything?

MJ: No.

M: Never?

AH: We have to document in the patients file "patient allows us to ask the pharmacist". We have to write that down. That is approved by law.

M: Do you need to identify yourself when you call to a pharmacy?

MJ: Usually I say that I'm a doctor from the Amphia Hospital and that I need to know the medication. So it's not really very safe.

M: I thought that you need to give the BIG number…

MJ: No, we don't use that in reality. Normally we don't have to give the BIG number to the pharmacy to get some information. The information which we want to know is not really top secret. We ask the pharmacy, for example, what kind of antibiotics the patient got recently because the patient's really doesn't know what kind of medication they are using.

AH: The contradiction of the situation in the Netherlands is that the politicians don't allow us create general EPR's throughout the whole country, but in the mean time we send personal information of patients by e-mail, so it is even worst now! Or by phone without the identification, so…

M: And when you call to the pharmacy, which information do you need to give to identify the patient?

MJ: Name, date of birth and sometimes the address.

M: And not the health number?

MJ: No, it is not necessary.

M: And is it just the doctor who can call to the pharmacy or can a nurse also call?

MJ: I think if you ask the nurse to ask the information about the medication she will get the information as well. But it depends on the pharmacy. We don't have the experience that it is very complicated. Normally in reality the doctor should call the pharmacy.

M: And if the patient wants to know his medication history, can he also call to the pharmacy?

MJ: Yes, he can. Most of the times he will go to the pharmacy and asks about his medication.
And the pharmacies do call us as well about the medication. When it is not clear for them, sometimes they call us to ask what we want to prescribe.

M: When is not clear…when it is a hand written recipe?

MJ: Yes, the hand writing or fax or if is different medication than the last time, and if is not clear, they will call us.

M: To finish the interview, all departments from the hospital can call to the pharmacy to ask the information?

MJ: Yes, all departments can get the information. The principle is the same; it doesn't matter if you are from intensive care or emergency department, etc.

M: Thank you for your time and cooperation with the research for my study. I will make a transcript of the interview and would like, if possible, to get your feedback. Do you agree with that?

MJ/AH: Of course.

M: Can I have your contact information to send you the transcript by e-mail?

MJ: Yes, I will give you my card.

AH: I will give you mine too.

M: Thank you once again.

B: Thank you very much.

Interview with Dr. Relin Verzijl-Zeegers – Hospital Pharmacist
Amphia Ziekenhuis
Breda
November 7, 2011

RV: Relin Verzijl-Zeegers
M: Margarida David
B: Bart Wouters (Interpreter)

Notes: The interview was tape-recorded with the authorization of the interviewee and the interpreter.

M: I´m writing a thesis for my master and the subject is to design an informatic application to have access to patient medication history in Portugal, especially in the emergency department. This is why I would like to understand the reality of this subject in other countries.
I think Bart sent to you the question list for this interview.

RV: Yes, I read it, but it is not always easy to give a simple answer…

B: Some questions are more for physicians and doctors and others questions are more for pharmacists.

RV: And you've also talked with the physicians about medication and databases or not? Is the subject bigger than only the pharmacy part?

B: Yes, that's the subject. The electronic prescribing of medication…

RV: We've just started with this project and we hope we will finish it next year. It's a very big project. Other hospitals in the Netherlands are used to prescribe not only on paper. We only work on paper. We put it in our own system in pharmacy, but the physicians are not prescribing digital by computer. But they will be next year.

M: So next year (2012) everybody needs to prescribe electronically?

RV: Yes. We have a law which says that we have to prescribe electronically on the 1st of January 2012. It is an obligation imposed by the Inspection of healthcare. It's an organization and they said everyone has to prescribe electronically by the 1st of January 2012, but not everyone (all hospitals) will succeed doing that at that time. If you have a plan and they can see you're working on it, then it's no problem. If they know you are working on the realization of prescribing by computer then it's ok. Because, in this hospital, we have decided to change the complete software of the entire hospital. And that's why I wasn't able to make this deadline for electronic prescribing with my system, because I knew we had to switch to another system. That's why it was on hold for a couple of years but now we've changed to the new software last May (2011).

B: That's EPIC.

RV: Yes, EPIC.

B: We already had the opportunity to see the EPIC system.

RV: That's why we completely had to get rid of the old software first and get in the new software and then you can build the rest. So the first step is to get the new software in our hospital and the second step now is prescribing. So it was impossible to prescribe electronically.

M: So you are going to use EPIC to prescribe electronically?

RV: Yes.

M: EPIC is the software for all different electronic modules in the hospital?

RV: Not everything. It's for the doctors and the nurses but not for laboratory. They have their own system. There is an interface between the lab system and Epic, so the results of the labs are sending to Epic.

M: Ok. So they have integration with EPIC.

RV: That was also what we wanted but it was not possible. We have to build a complete new system of medication in EPIC. We have to start all over again to rebuild everything.

M: Sometimes it's necessary.

RV: Yes, that's true. There are a lot of good things about it because everything is integrated. So if we prescribe medication you can also see the lab results and that's very nice to have when you prescribe a specific medication. It's very good to have all of this integrated because then you can see all those things.

M: So about the question list… I already know that the physicians can have access to the patient's medication history through telephone, fax or email.

RV: I can talk about here in hospital and not about the situation outside hospital. But the physicians here can now see in EPIC the medication of the patients in the hospital and also their history. We put all this information in our system and the physicians can view it in EPIC.

B: Yes, but that's the medication that the hospital pharmacy, provide to patients.

RV: Yes. It's indoor medication.

B: But if the physician wants to know what kind of medication the patient is using when he's coming to the hospital?

RV: That's a problem. The physicians have to ask the patient.

M: And if the patient can't respond? Can't answer?

RV: Then we have a problem!

M: So you call to the pharmacy?

RV: You can if you want, but I think the physicians don't do that. . We have almost 700 000 patients visiting each year this hospital only on the polyclinic department. So as out-patient (I think they call it ambulatory). Next to that we have about 90 000 patients coming in the hospital as an in-patient to have

surgery or whatever. So we see a lot of patient's everyday here in hospital… and the physicians see the most of their patients not when they are here in a hospital bed but in the polyclinic department.

B: Policlinic means that patients don't stay in the hospital. They come to have a meeting with the surgeon or the physician in the hospital.

RV: Just a meeting with the doctor, not to stay there.

RV: And we have about 700 000 meetings each year and all those times we have to know what kind of medication the patient is using. Most of the patients don't know what they are using. We did some research a few years ago and about 20% and 50% of what the patient is saying (about their medication) is wrong. This month, in the whole of the Netherlands, there is an information campaign. Everywhere you can see posters on the wall: "If you go to the doctor, bring your medication list".
So the physicians will know what kind of medication the patient is using, because this information is not electronically given by the community (or local) pharmacy to the hospital. In the hospital pharmacy we are able to see the medication of the patients outside the hospital in the electronic system of the community pharmacies from this region (Breda and region) because they have one system and we have also computers with that system here in our hospital, but only on a few places in the hospital. Only the pharmacy technicians can see that information.

B: So, that's possible…

RV: Yes, it's possible.

M: So, you don't need to call to the pharmacy, you can see in the system.

RV: Yes, we can see it, but most of the physicians don't know.

RV: In the hospital pharmacy, we have a pharmaceutical service point.

RV: And when patient comes for a pre-operative screening, they also talk to the pharmacy technician. Over there the technician has access to the database of the local pharmacy. She prints the medication list and discusses the completeness off the list with the patient.

B: But just from the local pharmacies in this region?
RV: In this region.

B: And this region is what? Just Breda or also Etten-Leur...

RV: Breda, Etten-Leur, Zevenbergen, Rijsbergen. Oosterhout, Made, Geertruidenberg, dongen, Rijen en Raamsdonkveer.

B: The mid-western part of Noord-Brabant.

RV: It's very nice to have this possibility, because right now there are not many hospitals that have this kind of luck. When the patient is coming here for a surgery, he will get a pre-operative screening, and then the technician will ask the patient what kind of medication he is using but he uses the list of the community pharmacy. So he can check with the patient this list and then we know what the patient is using. We do this only when the patient is coming for surgery. The pharmaceutical service point looks everyday who is coming in hospital for surgery departments and print the information from the

community pharmacy and bring it to the ward so they can use it this information and to check it with the patient. And when the patient is not in this region, the technician will call to the local pharmacy of this patient and ask if they give the medication information of that patient.

M: Just if the patient is not from this region.

RV: Yes. Then we call to the pharmacy or ask by fax. Not by email. There's no information exchange between pharmacies by email.

M: Ok. By telephone or fax.

RV: And this software application we use for in this region.

M: And do you know the name of that software application? Is this Medicom?

RV: Pharmacom.

M: Pharmacom. And what is Medicom?

RV: Medicom is the medical part of Pharmacom. They are connected. It's from Pharmapartners. Pharmacom is only the pharmacy part and Medicom is the physician part. And they are connected with each other. It's from one firm.

M: And all the pharmacies in this region use the Pharmacom?

RV: Yes.

M: They don't use different kinds of software?

RV: No.

B: And Pharmacom is also connected with the family doctors?

RV: If the family doctor is using Medicom, then they are connected and they can get the information from Pharmacom. They can see the information in Medicom and in Pharmacom, but I don't know for sure. There are many communities of physicians and I don't know what they are using outside the hospital.

B: We have a meeting with a family doctor this afternoon. And local pharmacies will help us some more.

RV: We only have 12 computers in hospital where we can see Pharmacom. Not the whole hospital can see this information. It's also because of the privacy for the patient.

B: Just the pharmacists can see?

RV: Only the Pharmacy technicians and the pharmacists can see this information.

M: So the answer to question number 3 (The access to medication histories through pharmacies is: National, Regional or Local) is regional. National is just if you call…

RV: Yes. National is… we have the LSP…

B: The National Switch Point, but it is not working yet…

RV: No. We are talking about it for more or less twenty years already and it's still not functioning. We are trying to start it again to... Finally, maybe it will come and it will function, but I think we have to wait a long time. Until that time, it's nice that we have these possibilities in the region, because we can work with this solution. But someday, with LSP it will possible throughout the whole country to see all medication of a patient, also from a patient from the north of the Netherlands. I think it will still take a few years to get there.

M: So the pharmacies allow access to the medication history of patients...

RV: We enter every medication order we get in our computer system and if you want to see what has happened two years ago you can see everything what happened two years ago.

M: From the pharmacy?

RV: From the pharmacy in our hospital. And also the pharmacies outside hospital can look way back and see.

RV: But no one can see the medication except the pharmacy department, also outside the hospital. The pharmacies enter the medication in their system and only the pharmacist and the technicians can see that medication history.

M: When you say technician you are talking about the physicians?

RV: Pharmacy technicians are pharmacy assistants.

M: Pharmacy technicians?

RV: Pharmacy technicians.

B: Who prepare medication for the patient?

RV: Yes. In other countries they don't have technicians or they are not as well educated as in the Netherlands, because I know, from a discussion we had with EPIC, that in America the technicians are from a different level than here in the Netherlands. Here they are very well educated and do a lot of work.

M: And the patient needs to sign an informed consent?

RV: They should. But that's very difficult to arrange. We can say, in hospital, it's something which community pharmacies have to ask. We have to have a signature, an approval, that the patient agrees and you can get the information from the other (local) pharmacy, but we have only put it in our introduction for new patients on paper. When patients come here for a surgery they will get all kind of information about what he is going to do here, about the pre-operative screening and when surgery will take place. And in this introduction paper is also the information that we are able to ask the information from the community pharmacy and if he doesn't agree he can raise objections on getting the medication overview from the community pharmacy. It is not really the way it should be but it's impossible to do it the correct way because we get the information about the patient before the patient is visiting hospital.

B: It's the other way around!

RV: This discussion is all over the Netherlands. They are discussing the idea but it's not working when you have to ask to patient in advance every time. The patients think that we get the information from the community pharmacy and that we give the information back. They find this normal.

M: Well, but the patient just needs to authorize one time. And if he then decides that he doesn't want his medical information available he just need inform that.

RV: Yes, we already discussed this often, but we think that this is a job for the community pharmacy. The community pharmacy has a different and closer relationship with the patient; we (pharmacy hospital) don't have that.

B: That's a difference here in the Netherlands. In Portugal you don't have a thing like a family pharmacy, like a family doctor. You have many pharmacies in the city and you can go there with your recipe and you'll be served but it's not that you have one pharmacy where you normally always go to and your name is in their system, etc. It's different.

RV: Here in the Netherlands you can also go to another pharmacy. It's possible, but most people go to their own pharmacy. It's better to go to your own pharmacy, because they know everything about your medication, so what you are and what you have been using. Otherwise you have to tell that at the other pharmacy and then they need to see if you have some problems with different medication.

B: But, in this region (Breda), because they all use Pharmacom, so they can see.

RV: Yes. If you go to another pharmacy than your family pharmacy to get some sleep medication, for example, and you don't tell that other pharmacy that you normally get your medication from the other (your family) pharmacy, they will give you the medication. Only when all the pharmacies are closed, at night or during the weekend, patients have to go to the one pharmacy that is on duty. There they can see the medication from all patients from the region, because they can look in all the pharmacy databases in that region and get the information. They call this the OZIS connection.
All the pharmacies using Pharmacom are connected with each other. If you want to have information about a certain patient you enter a date of birth and a name. Then you search for all the different databases of the pharmacies and you'll get the information. But the problem is that this information is not always very correct, because every pharmacist who works with Pharmacom has his own way of entering the medication and dosages in this system, it can give wrong or confusing information. You have to be very careful with that.
In the end they will stop OZIS because the LSP…

B: The National Switch point.

RV: The National Switch point will take over that part. In a few years…

M: To conclude, just the technician and the pharmacist can access the medication history of patients.

RV: Through Pharmacom.

M: By what way can the patient's medication history be accessed in Pharmacom?

RV: With date of Birth and with a name you can find the patient. First, we have to know to which pharmacy the patient goes, and in which city, then you enter the date of birth and you get some names and then you choose the name of the patient.

B: And the technician how does a technician identify himself in this system?

RV: They have a login code. But the problem is that all the technicians here in the hospital pharmacy use the same password. Because we can't add or change anything in the system and it's only for the pharmacy department. It's only to look for the medication. It's impossible to have different passwords, because we have so many technicians.

M: But the Pharmacom should give a different user and a different password.

RV: I think for our objective, just to look into the system, one is really enough. The computer is located in the pharmacy and it's only accessible by the pharmacy. So, there's no one else, besides the pharmacy technician and the pharmacist who can get access to the computer.

M: So the answer to the question 7 (who can access the patient information) is pharmacists and pharmacy technicians.

RV: Yes. But it's only about Pharmacom and other outside information. It is different situation if you're talking about the medication inside the hospital. Pharmacom is only to look outside the hospital and get information of the patients who are coming into the hospital, but inside we have another system.

B: So, that's EPIC.

RV: EPIC is the new software but for the pharmacy now we still have Centrasys, that's our software and we will be using for a little while longer, because the logistics have to be in Centrasys, our system, because EPIC is not ready for that yet. They are building a logistic system in EPIC.

M: You need to look to Pharmacom to have the list of the medication from outside the hostpital and in Centrasys to see the internal prescriptions?

RV: Yes, that's right. Everything the physicians prescribe for patients inside the hospital we enter in our own system. So, if you want to know something about medication inside the hospital then everyone can see the information, the nurses, the physicians, etc.

M: And then, the information that you're going to see in the pharmacy, you're going to put in your system here in hospital?

RV: Yes. The physician writes the prescription on paper and we enter it in our system. Like normally you go to the community pharmacy, you have a prescription and you give it and they enter it in the system and you get your medication. And that's the same we are doing here. So, I don't know if you only want to focus on the Pharmacom, because that's the outside pharmacy system and Centrasys is inside (hospital) pharmacy system. So it's quite different.

B: No. It's about the process of e-prescribing the medication. You do it inside as well as outside. And it's good to know the difference between looking outside through Pharmacom and the communication inside of this hospital through Centrasys, and later on EPIC.

RV: And EPIC will be also for prescribing to outside patients. There's no connection between EPIC and the community pharmacy, so we will still have to print. When you're prescribing by computer you will have all medication and interactions between medications. But you still have to get make a print and the patients still need to take it to their local pharmacy.

M: And then they enter it in the system?

RV: Yes, they enter it in their system and they check it again.

M: This is why it's going to be easier when the electronic prescription is ready.

RV: Yes. It would be nice and we are going to investigate if it's possible to get an interface between Pharmacom and EPIC. It would be nice if EPIC could send information to the Pharmacom system.

M: So, and can the patient have access to his medication history?

RV: The patient?

M: Here in the hospital or in the pharmacy outside?

RV: If he wants, he can ask, because the patient is the owner of his own medical file. So he can ask if he want to see it and then he gets a medication list of what he's using or what is entered in the system. Here in hospital they have never asked, because they get the medication from our department and we make a list so the nurse can see which medication and which time the patient have to have this medication. But some patients, who can take medication by themselves, they don't have to ask the nurse, but they get the medication and they can take it by themselves. Sometimes we give them a list so they know what they have to take. But that's not very often.

M: So, and talking a little about types of medications that you can see. For example, if you want to see the medication history from Pharmacom, you just know the medication that was prescribed by the doctor or you can see another kind of medication? For example, if I'm going to the pharmacy to buy a paracetamol.

RV: It depends. If the pharmacy put it in the system, then we can see. Otherwise, we don't.. I think most of the pharmacies don't enter this information in their system. So, when we have patients here for their pre-operative screening, we ask what kind of medication the patient is using through the pharmacy and we always ask which "over the counter products" they are using.

B: Like a normal painkillers or things like that, for which you don't need a recipe?

RV: Yes. We always ask because I don't think the community pharmacy enter it in the system.

M: Do you think this is important information?

RV: Yes, it's important. We always ask about the medication. Sometimes we see the patient takes a lot of paracetamol and sometimes too much. A patient might think it's not so important but it's important that you do not take too much paracetamol.

M: And the same for the homeopathic products?

RV: Yes. We also ask that. It has to be really important medication, and then we enter it in our system. When a patient uses four times a day one gram paracetamol, we put it in our system. There is no prescription that the patient has taken it and we want to know that the patient has taken it. But we skip the homeopathic medicine.

M: Sometimes you have some homeopathic medications which are not very good for the patient…

RV: Homeopathic we are not interested in and they don't get it here in the hospital. So, if they want to use that, they have to get it from their own pharmacy. We don't order that.

M: And you can see all the medications in the system?

RV: When the physician has prescribed something, we enter it in our system and we can see everything.

M: Because, for example, in Massachusetts they can't see the drugs for AIDS.

RV: In our system as we are working now, every patient who is coming in hospital and gets medication and the medication is dispensed by the pharmacy department, we enter it in our system. If they, the doctors, don't give the information to us, then we don't know and we can't enter it in our system.

B: Of course. It depends on the co-operation of every one.

RV: And we also want to enter medication patients are using by themselves in our system, because we want to know all the medication they are using. Otherwise we can't see the possible interactions between the medication and it's very important to see those. So we enter as much information as possible in the system.

M: So, for the law… there are no exceptions?

RV: In our hospital and in our pharmacy we do not have any exceptions.

M: In the Netherlands?

RV: I don't know. Sometimes, in the system of a hospital, you may not put in the medication if the patient requests that. But, in all years that I'm working in the hospital pharmacy, I've never had such a case.
But with the National Switch Point everyone in whole Netherlands got a letter asking if we want our information in that system.

B: I had that letter.

RV: And you can say "no I don't", then you are not in the system and they can't see anywhere what medication you are using. If you have an emergency problem, then no one knows what kind of medication you are taking. But, every person has this possibility to say "I don't want to give my information".
I think with the National Switch Point maybe more patients will say "I won't… I'm not happy to have my information over there in the system…everyone can see it". When you have regional system, I think, no one ever thinks about it.

B: No. It's just… it's there.

RV: It's there and it's easy. Maybe it's not so big, like a system for the whole country. It's just a region and like that we don't have the problems which the national database has. In all these years in which we get the information from the local pharmacies, only one patient was not happy that we had that information.

M: And for how long is the medication history kept?

RV: 15 years by law. For 15 years we have to keep the history. When we did not have an electronic database, it was by paper and we also had to keep that for fifteen years. This in case when someone wants to know something.

M: But this is in the hospital?

RV: No. It's for pharmacies, for prescriptions. The prescriptions have to be held 15 years.

B: Also for local pharmacies?

RV: Yes. We still have the same software from last century. So we have about 30 years of information. It's no problem.

B: If you want you could look back 30 years?

RV: Yes. I don't know how things will be when we switch to EPIC. We have to have a tool to look in Centrasys when it's necessary, but we also have all the papers. Because what we put it in our computer system is not the original prescription. The original prescription is still on paper here, because there is the signature of the physician. So we have to keep those papers for 15 years.

M: So you don't scan?

RV: No. We don't scan. Our technicians enter it in our system, but the original prescriptions are on the paper…

B: The original papers need to be kept for 15 years by law?

RV: Yes. Because it's not the original prescription in our database. It's what we put in. It will be different with EPIC. Then it's all in one system and we don't have paper anymore, I hope.

M: Which information is available regarding the medication history? (Question number 14)

RV: What we see in Pharmacom is…what the technician has entered in the system of the local pharmacy and that's the day when the medication started, the dosage. Also I think the physician; the pharmacy who delivered it. Also we can see the label they are printing. The contraindications, the allergies…

M: Posology?

RV: Indications, if they are put in. Location of prescription, yes. But there's not the location but the person of the prescription.

M: Name of the doctor who prescribed?

RV: Specialist or general practitioner, like that. Is it a doctor from here, from hospital or is it their own family doctor. I think those are the two things.

M: Maybe the specialty of the doctor who prescribed the medication?

RV: Yes. I don't think we always see the name of the doctor. We see the specialty of the doctor but not always the name. The date of prescription is the date when the medication started. The prescription is maybe written a week ago but the patient is getting his medication today.
Date of dispending. The phone number I don't see. Maybe it's in there but I can't remember I've see this information. We see what kind of medication it is. The dosage we see. Also the pharmaceutical form. We also see the amount, how much medication is delivered and how often the patient has to take it. We see medication allergies. And, I think, indications and contraindications when they enter it in the system.

B: You see contra indications?

RV: Contraindications. For example if a patient get some medication because he has hypertension, but this patient has also some other problems for which he's not allowed to have that medication. That's contraindication. Special medication which is not allowed to be given to this patient or otherwise he gets in trouble.
We can also see in allergy… we can see which allergy was reported by the physician or by the patient.

B: But those are not medication allergies?

RV: They're medication allergies. One of the most difficult things to arrange is allergies. For example, the patient says that he is allergic to a certain medication because he had diarrhea when he was using this medication. In reality it might not have been an allergy, and the patient was just sick. But if the pharmacy has entered this allergy in his system we have a problem when the patient needs this medication. You can't give the medication because it can give an allergic reaction, when probably it is not! So, that's very difficult to get the right information about allergy. It's the most difficult part for all pharmacy departments.

M: In the Netherlands you have public and private hospitals. Can the private hospitals access Pharmacom?

RV: We have in the Netherlands ZBC's (Zelfstandige Behandel Centra's – Independent Treatment Centers) they offer mostly only special surgery likes knee or plastic surgery, those kinds of things. It's not a community hospital. We have arranged connection with Pharmacom, because we have good connections with our community pharmacies, but I think the private hospitals don't have that connection. Probably they need to ask to the patients when they are coming to their hospital.

B: The patient needs to bring his own information.

RV: Yes, a medication list. I don't think they have access to Pharmacom, but I'm not sure; I don't know how they work. We have here in Breda the Medinova Hospital. That's a hospital for orthopedic surgery.

B: And that's a private clinic?

RV: Yes, but they also need to have an arrangement (agreement) with the insurance company. We also have connections with them, because if something happens over there, the patients can't stay there and they need to come to a real hospital.

M: For example, does a dentist have access to Pharmacom?

RV: I think they can ask the community pharmacy about that. But you should ask that to the community pharmacy. They will know. Because we only look in our hospital.

B: But with dentists, like family doctors, you have a personal relation. You have your own dentist, your own family doctor and your own pharmacy. So, probably they are connected and they can see. But that's indeed a question you need to ask the community pharmacy.

RV: I think they can ask the community pharmacy. The dentist will ask the community pharmacy. And now in a few weeks they have all the posters and everything to say "when you go to the dentist or the physician or to the pharmacy always bring your medication list with you". That's now a campaign we are doing here. I think it's also a responsibility for the patient. If you ask something about their medication, patients usually don't know. They have to know what kind of medication they are using. And if they don't know, because it's too difficult to pronounce, they should write it down and have always the list with them. I don't have a list with me. My mother was staying in the hospital this year and she didn't have it. I thought "I'm a pharmacist and she's doesn't have the list" and last time I said to my parents "you have to go to the pharmacy and get your list".

M: So that campaign is to explain how you should make the list?

RV: No. You have to go to the pharmacy and then you have to discuss your medication. You get a list from the community pharmacy and that is what you always have to have with you.

B: You can go to your local pharmacy and ask that list and they can print that for you, because they have the history of your whole life in their computer.

RV: And at that time, they check it with you, because when a physician here has stopped certain medication, I don't think the pharmacy knows. The pharmacy doesn't know. No one tells a pharmacist that the patient stopped using a certain medication. Only the patient knows it has stopped. So when the patient is going to the pharmacy, and he wants to have a list, they check all the medication that he's using and update this and enter the right information.

M: But for example, you have a prescription and you go to the pharmacy to buy the medications. But you can choose, well, I don't want this medication…

RV: Well, I know. We see it every day. That's why when the pharmacist makes a list together with the patient, the patient needs to say which medication he's using and how much. And then it's the real list. We know, because we see here during the pre-operative screening: "I don't use all because I only take half the medication, because otherwise I get sleepy" or whatever. But we write down that he only takes one instead of two pills. Then the information is going to the physician (the patient doesn't take the right amount). But we are not going to give him two tablets when he's here, because he's used to one. We have to give the patient the medication he's really using and it can be different of what is prescribed. That's very difficult to get right.

M: So the pharmacist enters in Pharmacom what he sells to the customer? Not the prescription, because probably the patient didn't buy all of the prescription…

RV: Yes, what the patient is using. They deliver medication and they can see when the patient has to come back for more. Sometimes they discuss that with the patient (are you still using the medication). If the patient doesn't say anything, then the pharmacy doesn't know. It's a problem. But when we use the

National Switch Point, we don't know anything, because we think the patient is using what is delivered. I know that is not the real situation.

M: This is why you should know what the pharmacy dispenses to the customer.

RV: Yes, that's what we know. We know what the pharmacy dispensed.

M: Not what was exactly the prescription but what was dispensed to the…

RV: No. We only see what was dispensed. It could be another prescription but then it can be that the pharmacy has called the physician to say "this is not the right prescription or it's not good in combination with other medication, we have to change it". Then they enter it in the system. So we only see what is delivered not what is prescribed. We are talking about Pharmacom.
Here we see what the physician prescribed and then, sometimes we have to call to say "That's not good, we have to change the prescription".

M: Question number 13: The history of medication contains information, like medication dispensed to the patient in the hospital. For example, in ambulatory surgery, the patient often takes medication dispensed by the hospital with him (e.g. for the next 2 days). You write that in the process of the patient?

RV: They don't get anything here from the hospital. I'm not so happy with it… If I could change it, I would, because I think it's better to give medication for one or two days to the patient, so that he doesn't have a problem when he gets out hospital and first needs to go to the local pharmacy to get the medication. But here, on this location, we have an external pharmacy.
When your own pharmacy is closed, you can get the medication there. And besides that we have a service point here, with pharmacy technicians. When a patient is going home the technicians will fax the medication list of the patient to his own community pharmacy. And then the patient can get his medication over there. So the patient is not taking his own prescription to the pharmacy. We fax it to the pharmacy.

M: Always?

RV: Almost always. It depends on the department. But it's easier to give the prescriptions here to the service point. Then they can check if everything is ok and if the home medication still has to be continued. And sometimes we split some medication, because we don't have that medication. And then when he goes back home, he has to use the medication he was using at home. And that's what the department service point is doing. And fax it to the community pharmacy so they can already enter it in their system and prepare everything for the patient for when he's coming there. And they can even deliver at home, if it's necessary. It's also possible. The community pharmacy can deliver at home.

M: Thank you for your time and cooperation with the research for my study. I will make a transcript of the interview and would like, if possible, to get your feedback. Do you agree with that?

RV: Of course.

M: Can I have your contact information to send you the transcript by e-mail?

RV: Yes, I will give you my card.

M/B: Thank you once again.

Interview with Dr. Renier van Dinter – NBD Manager, Janssen-Cilag
Tillburg, province of North Barbant
November 7, 2011

RD: Renier van Dinter
M: Margarida David
B: Bart Wouters (interpreter)

Notes: The interview was tape-recorded with the authorization of the interviewee and the interpreter.

M: I'm writing a thesis for my master and the subject is to design an informatic application to have access to patient medication history in Portugal, especially in the emergency department. It's why I would like to understand the reality of this subject in other countries. And because I know that in the Netherlands you have access to some information of medication I decided to start here.
Can you tell what your function in Janssen is?

RD: I'm working now for 17 year for Janssen and I have been doing a lot of different things here. First I was a sales representative, visiting the GP's and the specialists, then I became a marketing product manager, where I was responsible for a couple of projects in the company and now I'm the new business development manager for Europe so I'm trying to look at different products that are being developed by other companies and if those products are interesting for us we try to make a deal or an agreement or negotiation so that we, as Janssen which is part of Johnson & Johnson, can sell the products of ourselves. So buying products from other companies is the most important part for my job at this moment. I have a special focus for the medium sized countries which is Europe without the five biggest countries. So I'm more specialized in the central and eastern European countries, the Nordics, the Netherlands and the Alpine cluster Switzerland and Austria.

M: I would like to understand what the role of the pharmaceutical companies is in the medication history of the patient's…the connection with the doctors, pharmacies, hospitals, etc….

RD: At this moment I'm working at a kind of innovation project where we look at how can we raise compliance and solve compliance issues by creating a platform, an (electronic) dashboard, which is for the patients of course, so the patients have a platform at home online which is built up with data which comes directly from pharmacies and healthcare professionals. So connecting both the data that is available from the pharmacist and healthcare professional and fill the platform towards the patient. So all the medication is on the platform and also there's a loop between these 3 parties. So, if a patient has side effects he automatically enters that into the platform and then automatically a notification is going to the pharmacy and the pharmacist can act upon that. So, for example, he can call the patient, tell him that it is a side effect but that the patient should wait 2 or 3 days and keep on using the same medication in the same dose and after 2 or 3 days this kind of side effects will go away or, for example, this is a serious side effect and it has to be reported and the pharmacist has to change the medication for the patient. It's the interaction between the 2 or 3 parts in the system. That's something that I'm currently working on…

B: But is it going to be national?

RD: We are building the case for Janssen Europe and some countries are more advanced than other countries for such kind of innovation, so it is very small, but it is already available in the Netherlands, I think that 30% of the pharmacies in the Netherlands are using this at this moment. We want to build it in the Netherlands and we want to expand it in several countries in Europe.

M: I already know that the physicians can see the patient medication history through the community pharmacies. That's correct?

RD: In the Netherlands we have 2 different systems: we have the system of the physicians and the system of the pharmacies. At this moment they are not connected. The Government wants to have an electronic patient record, the National Switch Point, and really make it into one system for all of the Netherlands, where everybody (healthcare professionals) is connected to. But in April from this year (2011) the law which should make this possible, has been declined. Currently the system is on hold and at this moment there is no effort anymore to solve the issue and really build one system. So at this moment we have one system for the pharmacy and one system for the healthcare professionals.

B: But just on local and regional level the physicians and pharmacists connect. We already talked with a pharmacist from Amphia Hospital and she said that on regional bases we can access the electronic medication files from the pharmacies in the region.

RD: The pharmacies? Yes, but not the healthcare professionals.

M: The healthcare professional can call to the pharmacy or ask by fax and the pharmacy can send the list of the medication.

RD: The list of the medication…but the reason behind the two systems is that the healthcare professionals don't want to include the indication in the system, for which you get the prescription. Because if the pharmacist want to know the indication, then you, as a physician, can be scared that the pharmacy will take over the rights of the physician (and tell to the patient "so this is the indication so you should have this product"). The physician wants to have the rights, the power, and the control to decide which product should be prescribed. And that's the reason why the systems are not connected. When there already is connection between the systems it's always without the indications. And for the next year, 2012, they are trying to overcome the first hurdle and include, I think, for 5 or 10 disease areas also the indication into the pharmacy system. That's a transition and it's a pilot. So let's see if the pharmacies will use it.
So it's very important to understand that we have two different systems: one system for healthcare professionals, for the physicians, and one system for the pharmacies. And several hospital pharmacists can look into the regional pharmacy database.

M: Yes, with the Pharmacom system.

RD: Yes, for instance.

B: So you have Pharmacom system for the pharmacists and Medicom system for the medical professionals.

RD: But it's just one system. Besides Pharmacom and Medicom you have also other providers.

M: About the first question (By what way do pharmacies allow access to a patient's medication history?)…

RD: What way do pharmacies allow access to a patient's medication history? Every pharmacy has a computer and in the computer they have all the patient medication histories. It's online and real-time accessible. The physicians have their own system.

M: But the physician can't access the information in the database of the pharmacist?

RD: No, but it is in their system as well, so they don't need to ask to the pharmacist for the medication information.

M: In their system from the hospital?

RD: No, for example a GP…

M: Ok, you're talking about family doctor. I was thinking about physicians from the hospital, for example, from the emergency.

RD: Every prescription in the Netherlands is electronic, so there are no written recipes anymore from family doctors. In the hospitals things are changing as well in that way but there's still a long way to go. If a specialist would like to have an overview of the medication from a patient, then he would probably ask the pharmacy or the family doctor to come up with that overview (list). But mostly, in a hospital, it is done during an intake interview with a new patient at the hospital. Then one of the questions is what kind of medication you are using today. As a preparation for that interview they always ask to the new patient to bring their medication to the hospital as well. Because otherwise the patient just describes the colors of the medication, etc…

B: In the hospital the pharmacist told us that they did a research some years back to check that question…and the result was that 50% was right and so 50% was wrong. So now they have in their own pharmacy department in the hospital some computers with which they can access the database of the local pharmacies, so they can always check. And she said that most of the times they already do that in advance, because they know when a patient is coming to the hospital for the intake interview so they already check his medication list. And then when the patient arrives to the hospital they ask to the patient if they can check his medication history at his pharmacy. This is the other way around…

RD: I think it is a good approach, but I think is a local approach. This is something that, for instance in this case, Breda is doing, but probably it is not common in every hospital in the Netherlands. All the information from both databases is coming together at the healthcare insurances companies, but the healthcare insurances companies don't do anything with that information (except billing). They are now thinking about building databases. For instance Achmea, which is one of the four main healthcare insurances companies, has built a database now and you can do research on that. But it is still not possible today to really get information and get an overview of all medications.

M: We talked about the informed consent that the patient should sign…and I already know that they don't do that…

RD: There's no informed consent. The patient doesn't need to sign. It is private information…

M: Because is private information…

RD: That's the reason why the Electronic Patient Record is not going to work at this moment in the Netherlands, because the privacy of patients should be guaranteed.

B: But they can't do that yet…

RD: Well we had one attempt, I think, where you should…I think everybody in the Netherlands received a letter where we should have signed for the fact that your data could be collected in the Electronic Patient Record system. But it was once.

B: It was last year.

RD: Yes, it was last year. But it is not normal. Normally we don't give any consent.

B: Normally, when you go to a hospital, officially they should ask you if they can access your information through the family doctor or the local pharmacy and you can say yes or no. But at this moment it is never an official form that you should sign, it is always an oral question and an oral agreement which by law is binding. That is what one of the doctors, who normally work like that, told us this morning. They ask, the patient says yes and afterwards, in the report they make, they put that the patient has agreed.

RD: I think at this moment in the Netherlands it's a kind of a grey area. It's not black and it's not white, it's just in between. We do it the way we do as long there are no excesses in using the data in a wrong way.

M: About question five (How does a physician identify himself when he wants to access information from the patient's medication history)…

RD: The physician has his own system, so they don't connect with the local pharmacy or other pharmacists.

M: And by what way can the patient's medication history be accessed?

RD: The patient's medication history can be accessed with the address, date of birth, full name, health number, civil identification number… all this information is in the system at the moment. The health number and the civil identification number are getting more and more the same, so it is easier to have just one identification number and all the other things are connected to that number as well.

M: Do you know if a private hospital can access a patient medication history?

RD: I think it all depends on the way people are working together. For instance, in Tilburg or in Breda, I think most pharmacists came together and said "ok, if we want to have shared services during nighttime or during the weekends, it is important that we have access to all the information of all patients in Breda. So let's collect and connect all the available data in our region". And that is the way Tilburg is working as well, because they agreed together to share the data, they can access the data from the other pharmacies as well to have a clear overview. For public hospitals I think is more or less the same. If a public hospital has an agreement with the other parties they would be able to access that information. If not, then it is a kind of a solistic way of working. Probably they need to ask consent to the patient to contact his local pharmacy.

B: Or they ask the patient to bring the list of medication that they are using. We understood that there is going to be a campaign about that, now or in the next month, which tells patients that they should always have a list of the medication that they use with them at all times.

RD: I never heard about that but I think it will be very difficult. I think the most appropriate way to have access to all the medication will be with a kind of a bank card. And every time you have new medication you just need to ask to put that information on that card. Otherwise the older people have a huge list of medication, and it is impossible. Maybe it is a good idea but in practicality will it be difficult.

M: My study is to try to design an application which can have all the medication history data of patients. And of course in the end of my study I hope I can have solutions for the Portuguese reality. I already thought about that because I read some articles about that subject.

RD: Did you already hear about the Danish system? In Denmark. It is called Sickfund. It's an application developed by IBM, and that's a real electronic patient record. In this one system all the information is accessible for healthcare professionals, pharmacists and hospitals, so that's the ideal solution. I think it is a very nice example of how a system like that should work.
For example, the credit card solution with all the data on it, if you have all your medication data on this credit card it is really a lot of private information. And if your credit card gets stolen or someone else just takes it and reads the information that person can see what kind of medication the owner of that card has. If you have all this data on a central database and the only access to that central database is through your personal access by your credit card. I think that would be much safer. And it wouldn't be a problem if you lose the card; you just apply for a new card, have a new login and nobody can have access to your data on the system.

M: About question number 11 (what kinds of medications become available on the medication history of patients)…

RD: All medication is available in the system. Also, for example, for HIV medication there is no exception. But what you see is that patients with HIV are going to specialized pharmacies. Often they don't go to their own pharmacist to get their HIV products but they just go a city nearby or…

B: To be anonymous!

RD: Yes. But the information is in the system, but is all about visibility.

B: That is the downside of local pharmacies, a kind of a family pharmacy where you use to go since your child. If you have a disease like that and you need to buy your medication I think you don't want to go to your family pharmacy. So you go to the pharmacy in the next city to pick up that medication.

RD: Especially in the beginning, when HIV still was a very terrible disease that was the case. Nowadays HIV medication is becoming very complex, so you see another problem as well. Because you have 3 or 4 different kinds of medication, all with different interactions between the medication, and a normal pharmacist (probably they are not willing to admit that) has no clue any more on what to do if there's an interaction, which product should be switch or what advice should be given to the patient. And that's why some pharmacies are now becoming more or less experts and really specialized in HIV medication and that's why patients are willing to travel for an half an hour or more to a specialized pharmacist.

M: But in the medication history of the patient that information exists?

RD: Yes.

M: I ask this question because, for example, in Massachusetts, physicians in some Emergency Departments had access to patient's medication history, but the database was incomplete caused by the Massachusetts restrictions (by law) on the displaying of mental health and HIV. And that project was discontinued because the physician's didn't know if the patients had HIV.

B: They excluded that information from the database.

RD: That is the difficult part, if you want to have the inform consent of the patient to get their data in the pharmacy database. Most HIV patients won't be willing to have their data in the database. And then the other problem with the laws of a country…so sometimes not asking to patients are better, but it's all about privacy.

M: In this study that I saw about Massachusetts, the results in terms of the use of the database have not been sufficiently good because the physicians know that some information wasn't available.

RD: Yes, because if the database is not complete it is not useful. If you want to build a system it should be complete, otherwise people don't use the system because you can't be certain if everything is in it.

B: Talking about the role of a pharmaceutical company in this process …what is the role of a pharmaceutical company in the implementation of an electronic medication record?

RD: We don't have any role in this process for now. Until now there's no role for us. But I think the information will be very interesting for us.

B: From a commercial point a view?

RD: No…well, maybe also from a commercial point a view but also when we do research for our products. We have different phases during the development of our products: first the phase, where we study the effect of our products on healthy volunteers (it is a small group of 10, 15 people), then you have the second phase in which we'll be testing the product on patients who have a kind of illness, specifically for the product we are testing. So it's a small group of patients to see if they have benefits from the product to some small extend, if that is the case, then we'll go to a larger group of patients. But they are always very specific patients; they are patients with probably just one specific disease. And in real life, after the third phase which consists of a group of 1500 patients that we've studied, you come into the real world and in the real world the patient doesn't have just one disease but has probably two or three or four diseases and the elderly patients often have four or five or six diseases. Then your product is going to be combined with three, four, five, six, or even more, other products. We know that the elderly people have boxes with different pills but we don't know what the side effects would be or the interactions between all these different pills because nobody has ever studied that. If you would combine all this information in a database, also with all the side effects in it, then it will be very interesting for us to see if our product is often prescribed together with another specific product and, for example, for this kind of product and that kind of patient type you have to be aware that there is a chance of interactions. And currently we don't have that information.

M: Can we talk about the e-mail that you send to Bart - Pharmacists develop uniform drug list.
(Apothekers ontwikkelen uniform medicatieoverzicht)
http://www.pharmasite.nl/nieuws_binnenlands_details.asp?id_article=43319#

RD: Yes, of course. The KNMP is the Dutch Association for the Pharmacists and together with the NVZA, the Dutch Association of Hospital Pharmacists; they developed a uniform drug list. So pharmacists have now a new system from which a uniform format medication list for patients can be printed.

M: In the Netherlands, you just have one Association?

RD: Yes, all the pharmacies are connected with the KNMP. And all the hospital pharmacists are connected to the NVZA. At this moment, as the pharmacist in Breda has already told you, they don't have access to each other's database but, and they decided that, if you agree, then you can have access, then you can view the patient's data (In the case of the hospital in Breda only in twelve computers, like the hospital pharmacist told you).

B: Limited access.

RD: Limited access, yes. And it is not ideal because the information is still coming from two different databases, the pharmacy database and the hospital pharmacy database. And the hospital pharmacy database, I think, is a standalone database just for the hospital and not connected with other hospitals. Because every time you want to have a second opinion in another hospital you should go to your physician, a hospital specialist, and you will get a lot of papers and maybe a disk with X-rays and other things, and that is the information you take to the hospital. That's something the patient has to do. And this is a way, a goal, to enter in the next phase and have one system for all pharmacies in the Netherlands. And that's something they discussed last week which I think will be built in the near future. But again this is the pharmacies database, not a healthcare professional database, which is still a separated database.

M: To finish the interview perhaps we can talk a little bit about NICTIZ.

RD: NICTIZ is the the National IT Institute for Healthcare in the Netherlands. It was the company that was behind the electronic patient record. Which the Government now canceled.

M: So, NICTIZ is the company that coordinates the entire project?

RD: NICTIZ built the project.

M: I have some reports from the Netherlands about NICTIZ, but maybe they are not actualized…

RD: There are a lot of things which changed, because in May of 2011 they voted in the local Government about this project.

B: Last May they voted in the Government about the privacy issues and they threw way the concept law because of those privacy issues.

M: Thank you for your time and cooperation with the research for my study. I will make a transcript of the interview and would like, if possible, to get your feedback. Do you agree with that?

RD: Of course.

M: Can I have your contact information to send you the transcript by e-mail?

RD: Yes, I will give you my card.

M: Thank you once again.

B: Thank you very much.

RD: You're very welcome.

Interview with Dr Gert-Jan Schassfoort - General Practitioner
Etten-Leur, province of Noord-Brabant
November 7, 2011

GP: General Practitioner
M: Margarida David
B: Bart Wouters (interpreter)

Notes: The interview was tape-recorded with the authorization of the interviewee and the interpreter.

M: I´m making a thesis for my master and the subject is to design an informatic application to have access to the medication history of patients in Portugal, especially in the emergency department. It's why I need to understand the current reality of that matter in other countries. And because I know that in the Netherlands there already exists access to some information about medication. So I decided to start here.
I know that in the Netherlands there are Family Doctors and Family Pharmacists (or local Pharmacists), I would like to understand the relation and the connection or communication between the two.

GP: In the Netherlands the patients chose a doctor and when they stay in the same city and don't disagree with him they are always treated by the same doctor. So normally you go always to the same doctor. In this practice we have 4 doctors and if your own doctor is busy you can go to another and he can look in the same system. The system is based on that…that's one part of the relationship; one patient belongs to one doctor. The philosophy is that when you, as a doctor, learn to know the patient, how he is coping with his illness, what's happening in his surrounding with is family and it that could influence his health. So the best thing is to keep the same doctor so he knows your background and it will be easier for him to do the right things. For example, when someone is coming with pain in his chest and has a lot of tension in his surroundings and stress, it can be just that. The doctor doesn´t need to think immediately that it is his heart and he needs to go to the hospital.
It's the same with the pharmacies. A pharmacy has also a group of patients. When someone goes to live in another area of the city he'll maybe change to another pharmacy. Mostly he doesn´t change to another doctor but more easily to another a pharmacy. Usually he keeps always the same. In the Netherlands the pharmacists and the doctors use the same computer system for the medicine. The company which makes the software for this has a branch of this system that goes to the pharmacist and another branch which goes to the doctors.

M: That is Pharmacom and Medicom?

GP: Yes. And the name of the company is Pharmapartners. That's a much used system, I think, in all of the Netherlands, but there are also other general practitioners information systems. Besides Medicom you also have Pro-medico. I think there still are 3 or 4 different systems.
What I know is that Pharmapartners with Medicom and Pharmacom is the best integrated system for the medical history of patients.

M: Pharmacom can see the files from Medicom and Medicom from Pharmacom?

GP: Yes, I can show you. When we speak about Etten-Leur, all pharmacists we have, 5 or 6, work with Pharmacom and half of the doctors in Etten-Leur are working with Medicom. So every medication that is given to a patient, we can see.

B: But that is an agreement that you made with the pharmacists here in Etten-Leur because normally it's not always the case that the physicians or the family doctors can see the information from the pharmacists?

GP: Yes, that is right.

B: These are two separate systems, Medicom and Pharmacom.

GP: That's right. I agree. I´m not sure but I think that Pro-medicom can't see what the pharmacist is giving to a patient because the systems don't fit. Maybe there is a possibility but is not very easy, while with Pharmacom and Medicom it's very easy.
For emergencies at night and in the weekends we have a general practitioners post here in Etten-Leur and that post is also for the whole region around Etten-Leur. So it's also for the small villages and surroundings, in total 120.000 people. There are working 46 doctors or physicians and there´s also one pharmacist located there and he can look at all the systems of all the pharmacy's here in the same region.

M: But if you want to see information about a patient who is going to a pharmacy in Amsterdam, you can't? Just if you call…

GP: No. No, then I don't know. But I think there must be possibilities because there's one central location for the computers of Pharmapartners, it's in Amersfoort I think, in the center of the Netherlands. For each location, for example, Etten-Leur, they have a central computer, and all those central computers must be connected also. The current situation is not as far yet, but in the near future it must be very easy to see what is happening in other locations, and see it on your own computer.

B: That will be the ideal situation.

GP: Yes…

M: But the current situation is good for now…

GP: Yes, it's very nice.

M: So, in the first question from the question list (By what way do pharmacies allow access to a patient's medication history) the answer is via a software application, accessed in real time.

GP: Yes, in real time.

M: And then the hospitals, can they ask medication information via fax or telephone from the pharmacies?

GP: Yes. That´s what they do, I think.

B: Does it also happen that the physicians from the hospitals, if they need, ask to the family doctor of the patient the history of that patient?

GP: Mostly they ask that to the pharmacy, because they know that the pharmacy has all the information about medicine the patients gets. When you are doctor who uses Pro-medicom as system, you maybe don't know exactly what your patient gets at his pharmacy. Normally you should know it but the system doesn´t always work correctly. In the case a doctor, who's using Pro-medico, gets a letter from a specialist

from a hospital about a patient, he must control if the medicine are correct. The doctor must put it in the system by himself. While, in the case of Medicom, when the patients comes from the hospital, from the emergency, and they got some medicine, or a prescription for medication, they go to their pharmacy and I can see what he has got.

M: Ok, so the answer to the third question (The access to medication histories through pharmacies is) is regional.

GP: Yes, that's right.

M: Or local? Local and regional.

GP: And local. Both.

M: And here, in the Netherlands, the patients sign an informed consent form?

GP: No! They know that we have connection with the pharmacy but they don't know that the pharmacy also knows. On the other hand is very logical that I can see all the medicine that a patient is using and the pharmacy gives the medication to the patients so he knows also, of course. So, there´s no informed consent. In general practitioners post, the central post for emergencies at night and in the weekend, there is something written in the waiting room that informs patients that we can look in their history. When I work there, I don't only see my patients, but I see and treat patients from the whole region and they have to know that I can see in their history. Not only the history of the use of medication, but also the rest of their medical history I can see in their own registration.
The patients know. We have a big plate where is written that when you have objections against the fact that your history can be seen by somebody else, you have to lets us know that we can block that in the system, that's possible of course.

M: But just the doctors can see that information, not the nurses? You have nurses here?

GP: Yes, we have nurses here, and they can see the same information.

B: Every doctor and nurse needs to swear secrecy, confidentiality.

GP: And the nurses, when they work here they are told that they need to keep the same confidentiality.

M: And they do that?

GP: Yes.

B: I think it's a violation by law if they don't…

GP: Yes, that's correct.

M: It's an ethical question…

B: It's an ethical code.

GP: Yes, that´s right. So our nurses can see everything we can see.

M: And they can write in the files of the patients, in Medicom?

GP: Yes, but in every file you can see who is writing. So you can see who has done something or who has written something, but they only look in the system here, in this practice, I don't know that, there´s no registration when someone is only looking. In general practitioners post there you get a sign if somebody, not a doctor, has looked in the system. So I know, when my own patients has been there, I got a message of what has happened there and when they also looked in my system for the history of one of my patients, then I get a sign that a doctor has looked in my system.

M: That´s very good.

GP: And I'm in the board of the general practitioners post, and we have decided that the nurses there also can look in the system in the future because maybe it's easier if someone is calling with some complicated illness that they can look and see what is wrong. Then it must also be signed in the system that somebody, not a doctor, has looked or done something in the system. That´s still work in progress.

M: But everybody have a username and a password?

GP: Yes, that´s right. And there was a system…so everybody had a password here and with that visitor password in the system it's quite clear when someone has done something or has looked, but that's quite complicated. In the policy there was a countrywide system that would make it possible for everybody, every doctor, to look in the system and the patients agree that he is looking. But the policy is canceled for now, after already having invested millions and millions of euros in that system. So now we are trying, with all the doctors, to do something. Maybe we'll not go as far as originally planned in the policy, but we want to do something to make it easier to look in one system from everywhere in the Netherlands. That's the LSP.

B: That´s the National Switch Point, we heard about that this morning and it´s the law that they canceled or ignored in May because of privacy questions…

M: How do you identify yourself in the system?

GP: With my name and the password. When you subscribe for the first time in Medicom they also want my BIG number. But now I work here and I can work at home also…

M: You can work at home so you have connection at home?

GP: What I can do here I can do at home also.

M: And to identify the patient in the system?

GP: We have: date of birth, patients name, family name, address, postal code, BSN number. I just need to put one of these information items from the patient in the system. For example, I choose one patient and if I want to see his medication I just need to select the medication and I can see all the medication that he´s using now. If I want to see the medication history I need to select medication history and then I can choose month, year, two years or even longer…

M: And what is the maximum that you can access?

GP: Well, I don't know. Sometimes I can find something from…I´m using this system since eleven years, before we had another one that was replaced for the current one. We started here with this system in 1994, and sometimes I have information in the system that dates back till 1994.

M: In the hospital they say that they need to preserve the data for 15 years…

GP: That´s different, by law you need to keep all the data during 15 years.

M: And in the system you can see medication allergies too?

GP: Yes, of course. We can see allergies and signals (alert symptoms). For example, I can see in the system that the patient is intolerant to some medicine. The system gives a signal if somebody has some disease so he can't use some medicine. So the system gives an alert signal when I would give (prescribe) a medicine which the patient can't use.
And you can also see in the system how much the patient uses, the doses, who as given the recipe (prescription), till when the medication is being used, for how long is already being used and starting moment.
In our electronic system, when I have the diagnosis from the patient, and I select a prescription, I can make my own choice and the system can also make a choice, and in that case it will be cheaper for the patient. The system will have preferences based on protocols.

G: In the Netherlands you have used codes for diagnosis?

GP: What we have is ICPC- International Classification for Primary Care.
The entries in the software system allow allocating the diseases in order of appearance and frequency. This facilitates combinations and diagnosis and ultimately the correct prescriptions.

B: Can another doctor interfere with the diagnosis that you entered in the system? Example: In this patient's case, you can alter or delete things in his file, but if the patient is sent to another doctor (college from this practice or an outside practice), can this doctor delete or alter the information you entered?

GP: The doctors that belong to this practice can delete or alter, other doctors can't.
When you give the diagnosis codes that you try to be as accurate as possible, and when the patient is sent then to a specialist in a hospital, he will return with the correct diagnosis, in a letter written by the specialist. Then I can change the information in my system and enter the new, more accurate, diagnosis code. The other doctors from my practice center can do this to in case, for example, I am sick or absent.

M: But imagine is not the diagnosis but Anamnesis data. Can you delete it? Can anyone in that case, change or correct data?

GP: No. Here in this practice all the doctors can delete data, but from outside nobody can delete or alter it. The pharmacist can only see the medication and the contra-indications, intolerance, and allergies. He cannot see anything about the medical history of the patient.
When, for example, I do something at general practitioners post, for a patient that I don't know, and I don't look in the system to history of this patient, and I prescribe him some medication which is not good for him, the system will show a warning or alert signal, also at the pharmacy. And that is very good.

B: And that saves lives!

M: Does the patient have access to his medication history? How can obtain it?

GP: The patient doesn't have access to the system, only through me.

M: And if he requests? Imagine the patient goes on holidays and needs to have a list of prescribed medication with him?

GP: In that case of course the patient can have that information; he can ask to the pharmacy, it's the easiest way, but we can do that also.

B: He has the right (by law) because it's his own information, but he can't access the system, he needs to ask the pharmacy or the family doctor.

GP: Of course patients have the right to obtain information through me. The patient has also the right to have his own list of prescribed medication. If the patient would have access to this system there would be the risk that somebody else would have access through him as well, and that poses a great danger. The internet lines are all secured to prevent it.

M: Can you tell me if a private hospital can have access to the patient's medication history?

GP: No, at present no hospital (private or public) can access the system and obtain information about the medical history of the patient, and that's a pity.

M: So, in this moment the public hospital can ask the information by fax, phone, etc. And the private hospital?

GP: They also can ask by fax, telephone etc., they can request information from us or the pharmacist but only if the patient give permission for that.

B: But the ideal situation would be that all hospitals could have access to the system?

GP: Yes.

M: So, the answer to question 10 (Which departments in a hospital are allowed to access information from patient's medication histories), all the departments from the hospitals can have the information if they ask by fax or telephone?

GP: Yes, all the departments. I think they have now a central hospital system – EPIC, where everybody from the hospital, can see the information from patients in the hospital.

M: But EPIC only has the hospital medication data, not the medication dispensed in the pharmacy.

In the question 11, what kind of medications becomes available on the medication history of patients: just prescribed by the doctor? And the medicines not subject to medical prescription? For example when the patient buys medicines in the supermarket? You don´t have access to that information?

GP: Even when the patient is buying medicine in the pharmacy, which is not prescribed, it's not in the system. It is maybe possible that the pharmacy can see what they sold to the patient in their own system, but we, the doctors can't see that, we only see the prescribed medication.

M: And the homeopathic medicine?

B: Only if it's prescribed.

GP: Yes, that's right.

M: Are there exceptions in information from the patient's medication that you can't see in the system? For example, in Massachusetts, the physicians had access to patient's medication history in the emergency, but the patient's history was incomplete caused by the Massachusetts restrictions on the display of mental health and HIV. Physicians were disappointed with the need to filter sensitive medications.

GP: So the doctors couldn't see if the patients had HIV or not…

B: To protect the patients…

GP: Yes, I understand. In this system we can make a recipe (prescription) private. The pharmacy can see the prescription but another doctor can't see.

B: And then that kind of medication is invisible for other doctors.

GP: Yes, it's that. But I don't know if the pharmacist can do the same in Pharmacom.

M: Question number 12: for how long is the medication history being kept?

GP: Many years, many years. Sometimes I have patients who ask me if I can prescribe some medication that I already prescribed 10 years ago!

M: Question number 13: does the medication history contain information, like for example medications prescribed and administered in the emergency or in ambulatory surgery…

GP: The answer is no…it's a pity…
M: Yes, it's because you don't have any connection with the hospitals.

GP: Yes, that's right. We need to find a way to improve that.

M: But for example in the emergency, sometimes the doctor sends the report from the emergency to give to the family doctor and there you have the medication that the patient took.

GP: Not every time but when but normally yes, it's true, and when they send some information about medication or new allergies I put in my system.

B: And when the patient goes to the hospital to see a specialist, the specialist reports back to the family doctor?

GP: Normally it works in that way. With a simple control visit it doesn't happen all the time because sometimes it's not necessary, but when he's doing some really new examinations you get a letter and also going electronically, by email. If the patient has an appointment with a specialist in the hospital I receive a message in the system (in Medicom) with a report of that appointment. I can see the name of the doctor that saw the patient, what time and in what day, what's the history, etc. When I receive that message about the patient I read what happened and make a conclusion and then I put that in the file of the patient (in Medicom). When I receive the report or message in paper takes more time but we also put that information in the system.

M: Question number 14: which information is available regarding the medication history?

GP: Almost everything. Location?

M: That is where the doctor is working.

GP: No, that information not.

M: Date of Prescription?

GP: Yes.

M: Name of doctor who prescribed the medication?

GP: Not the name, but the code. We use the code of the primary doctor (specialist), so it's the code and not the name. But maybe in the pharmacy they see another information, I don't know exactly…

M: Specialty of the doctor who prescribed the medication?

GP: Yes, the specialty, not the name of the doctor who prescribed the medication.

M: Telephone number of the physician who prescribed the medication?

GP: No.

M: Date of dispensing of the medications at the pharmacy?

GP: Yes.

M: Designation of the medicinal (Paracetamol/Codeinefosfaat Sandoz)?

GP: Yes.

M: Dosage (paracetamol 500mg, codeinefosfaat-hemihydraat 20mg)?

GP: Yes.

M: Pharmaceutical form

GP: Yes.

M: Amount of tablets?

GP: Yes.

M: Posology?

GP: Yes.

M: Medication allergies?

GP: Yes.

M: Do you prescribe everything electronically?

GP: Most of the time, even when I go to visit a patient at home. Only when it is an emergency I give him the medication directly, but otherwise I go back to the practice and I put it in the system and then I send it to the pharmacy. The pharmacy receives the prescription electronically.

B: And at the end of the day, as a patient, you can go to the pharmacy and pick up your prescribed medication and you don't need to go with the recipe (prescription) in your hand.

GP: We also have a new system within Medicom and Pharmacom where the pharmacist gets a signal when, in case of chronic medication, the medicine that a patient is using is almost finished. Then the pharmacist will give a signal to the patient that their medication is nearly ended and they will make a new prescription for that patient.

B: And that goes automatically?

GP: Yes and I get a signal that the pharmacy gave a new recipe to the patient.
The pharmacy gives a message to the patient, which goes by postal mail, informing that there is a new medicine available for him. But first I receive a signal from the pharmacy and I need to agree with that. This is very new!
Many patients call to the medicine line (a telephone line) to ask new medicine and when it is chronic medication my nurse makes the recipe and I have to agree. Normally when a patient has a chronic disease, depending on which kind of disease (for example, high pressure and heart attack), we usually do some controls during the year, but once a year we do total control (blood pressure, cholesterol, etc). When the patient is at home we usually prescribe medication for the whole year. In these kinds of cases, when the patient asks for new medication, I first need to see if the patient came to the yearly control. If not, I usually prescribe just for the next two weeks but in the recipe I write a message saying that he needs to come to the yearly control.

M: Thank you for your time and cooperation with the research for my study. I will make a transcript of the interview and would like, if possible, to get your feedback. Do you agree with that?

GP: Of course.

M: Can I have your contact information to send you the transcript by e-mail?

GP: Yes, I will give you my card.

M: Thank you once again.

B: Thank you very much.

GP: You're very welcome.

Interview with Dr. Rob Kuiper - Hospital Pharmacist
Zuwe Hofpoort Ziekenhuis
Woerden, province of Utrecht

RK: Dr. Rob Kuiper
M: Margarida David
B: Bart Wouters (interpreter)

Notes: The interview was tape-recorded with the authorization of the interviewee and the interpreter.

M: I´m writing a thesis in medical informatics and this thesis is about having access to patients' medication history in Portugal. I'm starting in the emergency department. So, I'm trying to understand how that functions in other countries because I know that in some countries, like in the Netherlands, you can see the patients' medication history.
I can start asking how is the relation between the pharmacies, doctors, technicians, etc…

RK: I can tell you about it! And how's it organized in Portugal? Is there some kind of medication history?

M: Not too much. Portuguese Health System has suffered several changes, especially in the processing of hospitals into hospital centers or health units. The health units are composed of hospital and primary health care centers. In this case, for example, if a doctor prescribes medication to the patient in the hospital, the doctor that is working in the primary health care center can see that medication prescribed in the hospital because they use and they can access the same software.

RK: But, is it electronically, automated administrated?

M: Yes, because in Portugal now we are using the electronic prescription since the 1st August. It's the law.

RK: In whole Portugal?

M: Yes.

RK: And it's one system for the whole of Portugal?

M: No, one system no. We have different software systems to prescribe electronically. And each hospital/institution can choose the software which they want to use.

RK: So, they are different. It's the same in the Netherlands.

M: But now they need to use, it's an obligation.

RK: Ok. In the Netherlands, it's also an obligation on the 1st January 2012. That's an obligation that all of the hospitals and the institutions have an electronic prescription system. So, you said it's also an obligation in Portugal to have that and in the Netherlands it's on the 1st January 2012 when it's obligated. But we already have it…

M: You already have it in some hospitals?

RK: Not all the hospitals! The family doctors have it, not 100% but 90%, I think.

B: Most of them do have a good connection with the family pharmacies, local pharmacies.

RK: Yes, they have. Absolutely.

M: But everything is prepared to start in January?

RK: Well, most of the hospitals. I think about 20% of the hospitals don't have electronic prescription at that time. I don't know exactly what the consequences are when you don't have an electronic prescription. We will see in January! I think the inspection of health care… I don't know what they are going to do then and what the consequences are.

B: We heard yesterday in Breda, in the hospital we had a conversation as well, we interviewed there as well, that they are not quite ready yet and don't think they are going to make it in time before January but they said that the inspection will be satisfied if they can see that they are busy with building the system.

RK: Yes, there's progress!

B: There's progress and they can show a deadline, a goal.

RK: Yes, I think so. So, shall we answer the questions? First of all I want to tell you that we have two different pharmacies in the Netherlands. There's a difference between hospital pharmacy and community pharmacy. You entered the hospital and you see a pharmacy, that's a community pharmacy, inside the Hospital. We are a hospital pharmacy and we are connected, we have a good cooperation. But it's different, we are responsible for the medication for the patients inside the hospital and they are responsible for the patients outside the hospital. So we have cooperation and we want to organize perfectly so there are no problems with the medications when you're inside the hospital and you get out of the hospital. That's why we cooperate together.

M: In some situations like an episode of surgery or in the emergency department, patients get some medication that they bring home from the hospital pharmacy. Does that happen also in the Netherlands?

RK: When they use their medication at home and they bring it to the hospital?

M: The contrary! Sometimes in small surgeries, you can give medication to the patient. For example, the patient needs 2 pills to take in the next 2 days after the surgery, and the hospital gave him that medication.

RK: That's what we do also here. We give for 2 or 3 days medication to overcome the lack of time. But it's not really necessary! With a prescription you can visit our pharmacy in the entrance of the hospital 24hours a day, 7 days a week. We do it but it's not really necessary. It's just a service for the patients.
Shall we do the questions? Question number 1: By what way do pharmacies allow access to a patient's medication history? There are two ways, by fax and by software applications. Those are the same software applications that the community pharmacy uses. This way we can view the use of the medication from the patient outside the hospital.

M: Are you talking about Pharmacom?

RK: No, I'm talking about OZIS. It's Open Zorg Informatie Systeem.

B: It's an Open Care Information System.

M: This is from the Netherlands?

RK: Yes, this is from the Netherlands and about question 3 (The access to medication histories through pharmacies is national, regional or local), you can only use that in local, regional settings.

M: Local and regional, ok.

RK: That's how we work…

B: You're talking about the province Holland in the Netherlands?

RK: Not the province, it's just the region near the hospital.

B: Ok. That's where you can look inside the system of the local pharmacies, community pharmacies.

RK: Yes, local pharmacies. It's not very… we also have another system, the LSP.

B: Yes, it's the National Switch Point. We already heard about it.

RK: Yes, but there are political problems… We can't use it at this time. But I hope within a year we can also use that system and then we have the national information of all patients. At this moment we can only use the local patients' information.

M: So in every region in the Netherlands you have different software?

RK: Yes, there's different software but it's a system you can… it's just a database which can be used by different software systems.

M: For example, here (in Utrecht) you can see the medication of a patient from Breda?

RK: No, that's impossible. In that case we use the fax.

M: Ok, so you use fax for other regions.

RK: That's simple but still works. So, we use the fax still.

M: This is just for the pharmacies, the software OZIS?

RK: No, the family doctor they also use this system. Not all, I think, but some have access to that information.
Question number 2: If the access to medication history is through a computer application - yes;
Question number 2-a): Do all pharmacies use the same software? No, it's different software systems but the same database;
Question number 2-b): Is there an institution in the Netherlands that certifies the software used in the pharmacies? Yes, there is some kind of institution but I don't know the name.
Question number 3: The access to medication histories through pharmacies is local and maximum regional. But I think local is the best choice.
Question number 4: Do patients sign an informed consent form? No, they don't but they have to. That's a problem! Before the patient visits the hospital pharmacy, we already have the information and at that

moment we ask "are we allowed to use that information". If they say no, then we throw it away but they always say yes, it's ok for safety reasons. So, that's not really a problem.

M: So, in a meeting with a doctor, the doctor has already the list of the medication?

RK: No, we have the list of the medication and sometimes, especially in the Emergency Room, they ask for a list to the pharmacy.

M: To the hospital pharmacy or the community pharmacy? Or both?

RK: It can be both.

M: Yes, because the two have the connection.

RK: Question number 5: How does a physician identify himself when he wants to access information from the patient's medication history? I think that's a better question for a physician but I think it's the number of registration of healthcare professional.
Question number 6: By what way can the patient's medication history be accessed? I know the date of birth and a special number which I think it's the number of civil identification. But we use both, of course.
Question number 7: Who can access the patient information? Pharmacists and physicians, that's it.

M: Well, to the software just the pharmacy because the physicians don't have access to the application.

RK: No, but they can… if they have a number and have the software, they are allowed to access. So, two different questions: they don't use it but they can if they want.

M: So, they have the software?

RK: No, they don't have the software, at this moment. So we are the ones who have access to that information but if they want they can buy and they are allowed to use the software. For example, the family doctors, some of them have access to this information. At this moment, pharmacies and physicians can access the patient's medication history but outside the hospital and the hospital pharmacy is the only one who has access inside the hospital. But nurses don't and patients no, also. Strange, but it's how it works.

M: But they can ask the list?

RK: Yes, it's their information. So, they are the owners of their own medication history. But it's not very well regulated at this point, that's why there's the political discussion about the LSP – National Switch Point.

B: The privacy policy behind that.

RK: Yes, the privacy policy.

M: I read something about the patients' rights…

RK: Yes, they are very important of course but it's so important that the politicians said "LSP doesn't go further unless you have a secure system".

B: Which is a good thing!

RK: Absolutely! Only the medication safety is contradictory. I think it's good that the patient has his rights…

B: No, it needs to continue, of course!

RK: Question number 8: If the patient has access to his or her medication history, how can he obtain it? So, it's not organized now so… it's not possible at this moment.

M: Can he ask to the family doctor?

RK: Yes, of course! And he can ask the pharmacy, "I want to see my medication history" and then it's possible. But there's no access to the database for the patient.

B: So it's the family doctor or the pharmacist.

M: We heard yesterday, I don't know if it's happening now or if it's going to happen, about a campaign to inform people to always have a list of medication when going to the doctor or the hospital.

RK: Yes, that happens next week. It's a campaign in the whole of the Netherlands. It's organized by community pharmacists together with hospital pharmacists.

M: But patients need to ask to the pharmacy their medication list?

RK: Yes, that's what it is. So, go to your pharmacy, bring your medication history when you visit the hospital.

B: What they ask is for patients to pick up the responsibility of being aware of what they use for medication when they go to the hospital too; to be able to deliver the information.

RK: And for younger people it's good to ask! They know how to organize, to arrange medication history. For older people it might be more difficult but we can help.
Question number 9: Which institutions can be accessed for the medication history? Well, public hospitals but also private hospitals by the same way. It depends on your profession and it doesn't depend on the type of hospital. Family doctors and pharmacies, all of them.

RK: Question number 10: Which departments in a hospital are allowed to access information from patients' medication history? They ask us for the medication history but if they want, if they are doctors they can access that.
Question number 11: What kinds of medication become available on the medication history of patients? This is very interesting! It depends on the pharmacy. But I think they try to record everything they know. Also the homeopathic medication and also the medication like the paracetamol which is not prescribed by a doctor. So, they try to record everything they know about medication.

M: That's the big problem because this information is important …

B: But you rely on that? Let's say, if a patient comes in for a pre-operation and you have his/her medication list I think you would always ask if they currently use paracetamol or painkiller, a thing that is not necessarily on that medication list.

RK: Absolutely, you're absolutely right. That's the problem! They're not complete so we always have to ask the patients (together with the medication history) what is really used by the patient and then make a complete list of what's really used at that moment. That's a difficulty!

B: It's a struggle.

RK: Because it costs a lot of time to ask the patient in combination with asks for the medication list, to have a complete list. That costs a lot of time but we try and we think it's important.

M: So, you ask the patients and you put in the list? If the doctor asks the patient what kind of medication he's using now and compare with the list and then he's going to put that information where?

RK: In the electronic prescription system of the hospital.

M: And OZIS is going to integrate with that?

RK: That would be the perfect way but that's not possible. We can't put the information out the hospital in the OZIS. Only the community pharmacy can do that. So, that's a problem… we have a nice system but it's not perfect. It would cost a lot of years to make it perfect… but that's a problem… we can see the medication history but we can't put the information, that we put in our electronic prescription, there.

M: You have access to the patient's electronic record?

RK: Yes, we have. I can show you.

M: But you need to go there to see or do you have a sign to know the doctor put information?

RK: Our distribution system would recognize that and we have access to that information and when a doctor prescribes the medication we have to do some medication checks, out of safety, and after that we give the medication out of our stock to the patient. So, we have a system that is fully integrated in our distribution process.
Our medication safety checks are fully automated. It's in the system and we check it by hand for problems but it's fully automated. That's a very good system! We're the only country in the world that has some kind of professional system on medication checks, on safety checks. There are more countries that have a small system like it but not far as perfect as we have in the Netherlands. We are very proud of that!
I can show you for example, this is the medication used by this patient at the moment and when there is another medication prescribed by a doctor, they put it in the system and we can see it, we can check it and after that we can give the medication to the patient. And this works! These are medication checked signals…
This is the automated way of medication checks. If there's an interaction between two different drugs or there's a dose that's too much for this patient or the patient has problems with his kidneys and he needs another dose… that's how we check all the patients' medication. It's a very good system. But this is the software that we use, but the community pharmacies use another software, like Pharmacom you mentioned here earlier.

M: Here in the same pharmacy?

RK: No, that's the pharmacy downstairs (here in the hospital), the community pharmacy. They use another software.

M: Is there interaction between both?

RK: No, that's what we want to but it's still not perfect the integration. So we can't exchange the information the way we want to. That's still a problem.

M: Does that mean that here you have a different medication list? And the local pharmacy has another one?

RK: No, when a patient gets out of the hospital, they get a medication list with the medication which is used in the hospital. The patients go to the community pharmacy and they enter it in their system so there is no electronic exchange.

B: That would be the goal?

RK: Yes, that would be the goal, absolutely.

B: So you can look in each other's systems but you can't exchange the information.

RK: That's why we need the LSP!

M: Another question is if there are exceptions. In the same question, number 11.

RK: What kinds of medication become available in the medication history of patients? Ok. Well, I think there are no exceptions… we try to record all we can and we can only do it if we know which medication they use. We can enter all medication in the system, whatever they use. So, we try to enter it all in but of course it depends on what the patient tells us.

B: Can a patient ask to leave out information or ask to make it not visible to anyone else?

RK: No, in the near future we want to arrange that but at this point we can't make exceptions at that level. But, of course, for privacy reasons we need to arrange that kind of option.

B: Because we heard stories of patients who, let's say, the patient has AIDS and he prefers not to go to his own family pharmacy or local pharmacy but he's willing to travel 30 minutes to another city to be a little bit more anonymous…

RK: Yes, that is possible because when the patient says to the pharmacist "I don't want to use medication history from other pharmacies", then it's his right! So, that is possible if you mention that. It's up to the patient and what he wants.

M: I add this question in my research because in some countries, for example in the U.S.A. in Massachusetts, they have a national database with medication history but according to the law they couldn't have the medication for AIDS there. So, that database wasn't very successful because they didn't have all the information from the patients.

RK: Yes, but that's not the same in the Netherlands because the insurance companies is not allowed to have access to that database.

B: If the insurance companies would have access to the database, they could say "so you're using pills for HIV? Then we'll make you pay twice as much ".

RK: That's the importance of the privacy reasons.
Question number 12, for how long the medication history is kept? Well, it's 15 years, by law.
Question number 13: The medication history is accessed through pharmacies (medications dispensed by the pharmacy), yes. You're right; the history of medication does not contain more information like internal prescription. The history of the medication or the list of the medication which is in the community pharmacies does not have the internal prescription. That's exactly what you mean. That's a problem!

M: And the other one? Medication dispensed to the patient in the hospital – e.g. surgery?

RK: No, it's just at the moment of getting out of the hospital that the medication list goes to the community pharmacy. But in the near future, we want to give all the information to the community pharmacy and also the medication used during the stay in the hospital.

B: Preferably sharing the same program!

RK: Exactly! But that's the future and that would be perfect.
Question number 14: Which information is available regarding the medication history?

M: This is a little like you have here…

RK: We can also have history…

M: So this is medication in use?

RK: Yes, exactly!

M: And then you have the history?

RK: Yes, there's also history if there's any history because we have this system about a year. When there's history you can have access to that information.
Location of prescription, you mean the medication history in a community pharmacy?

B: For now it's in the hospitals! The location prescription is always in the hospital!

RK: But it's not registrated so I think the answer is no, because the only way is through the date of prescription and the name of the doctor who prescribed.
So, a)location of prescription: no; b) date of prescription, yes; c) name of the doctor who prescribed, yes; d) specialty of the doctor who prescribes, yes; telephone number of the physician who prescribed, no, not in this system; f) date of dispensing of medication at the pharmacy, no, not a date of dispensing…

M: Because here it's the same, the date of prescription and date of dispensing.

RK: Yes, that's right. In the community pharmacy that can be different.
g) Designation of the medication, yes; i) pharmaceutical form, of course; j) amount of tablets, that depends! When we prescribe at an outpatient treatment then we have an amount of tablets but inside the hospital we only have a period of time and we don't have the amount. You can calculate it but we don't enter it in our system.

M: Because here in the Netherlands you can buy a tablet but in Portugal you can't buy a tablet, only a box.

RK: Yes, that's in the community pharmacy also but here inside the hospital we give one tablet if they ask for it and not the whole box because it would be too expensive.
So, we only enter a period. When it starts and when it ends. If we know when it ends…

M: It's a little like posology?

RK: Yes, that's a strange word but… you mean dosage?

M: For example, you need to take 3 or 4 pills each day…

RK: Yes, we put it… i) medication allergies, yes. It's automatically checked, when we put an allergy in the system, e.g. paracetamol, you get an alarm if the patient is allergic.

M: So you don't have other information?

RK: Yes, we have the contra-indications. It's when you can't use insulin because you have some kind of disease we can enter it in the system and it's checked when you describe it.

B: So, contra-indications just tell what you can't use, right?

RK: Yes, that's right. And also a contra-indication can be given when the kidneys are not very good and then you have a contra-indication for a normal dose and you have to give a minor dose.

M: Just one question to finish the interview… about the relation between pharmacies and family doctors. Can the family doctor have access to a medication history from a community pharmacy? That was an obligation? Was it decided by the Government or was it an agreement between… just to understand how this happened in the Netherlands.

RK: You mean, we organized together with the physicians and the pharmacists a system that records the used medication and after that there was a problem with the privacy. When the first patient mentioned we were not allowed to use his information it became a political issue and then the politicians said we had a nice system, it's perfect for medication safety but it's not perfect for privacy reasons. We had to stop and arrange some kind of privacy requirements and after that we could go further with the system.

M: But was it the Ministry of Health or another institution from the Government? Like the electronic prescription is an obligation from the Government.

RK: Nowadays it is an obligation… you mean NICTIZ? Who was responsible for the LSP! Exactly and they want to arrange a good system for the whole country but the discussion about privacy started and it became a political problem. And the privacy protection is more important than medication safety!

M: Don't you have an institution to protect the patient's data in The Netherlands?

RK: No, it wasn't well organized. NICTIZ tried to make a data recording possible for whole the country but they forgot to think about the privacy. There was no institution that guarded that.

M: Because in Portugal we have an entity called CNPD - Portuguese Data Protection Authority, and if a company or organization wants to treat patient data they need to have authorization or permission of this entity for that.

RK: They've guard the privacy reasons and now we forgot that! But it slows down the process of medication safety.

B: There was another thing at the beginning of the question, what is different in the Netherlands, now we are very close to a perfect system but years ago there was already a communication between the family doctor and the family pharmacy or the community pharmacy. Not with the hospital but between those two there was, because we have family pharmacies… pharmacies that you go to your whole life (if you stay in the same village) and they record your medication history and your family doctor records your medical history and to combine those two is very good of course! And that was already developed here … between a family doctor and a family pharmacy…

RK: And after that the discussion about privacy reasons began in the Netherlands!

M: Thank you for your time and cooperation with the research for my study. I will make a transcript of the interview and would like, if possible, to get your feedback. Do you agree with that?

RK: Of course.

M: Can I have your contact information to send you the transcript by e-mail?

RK: Yes, I will give you my card.

M: Thank you once again.

B: Thank you very much.

RK: You're very welcome.

Interview with Dr. M. Stammers – Community Pharmacist
LLOYDS Apotheek
Etten-Leur, province of West-Brabant
November 8, 2011

MS: M. Stammers
M: Margarida David
B: Bart Wouters (interpreter)

Notes: The interview was tape-recorded with the authorization of the interviewee and the interpreter.

M: I´m writing a thesis for my master and the subject is to design an informatic application to have access to patient's medication history in Portugal, especially in the emergency department. This is why I need to understand the reality of this subject in other countries. Because I know that you have access to some information of medication in the Netherlands I decided to start here.
I know now that you have a Family Doctor as well as a Family pharmacist (or local Pharmacist) in the Netherlands. I would like to understand the relation or the connection and the communication between the two.

MS: I will show you how it works. We have here in Etten-Leur 14 family doctors and 5 pharmacies. The 5 pharmacies are all on the same computer network. And from the 14 doctors 7 of them are on the same network as we are. So, what we share is all the common things like family name, insurance company, etc. The doctors can also see the medication that we sold to their patients in the pharmacies. Like this they always know exactly the stages of the patients, what they are using or what they are not using, because the family doctor doesn't know what the specialist (in a hospital) prescribed. When we deliver this medication, prescribed by the specialist, the family doctor will know this through our mutual system. He has access to all the latest medication stages of the patients. The doctors that are not on our network can send us messages and when a specialist prescribes something we send those family doctors a message and they can put that in their own computer system. But I don't know if they do that. So it's better to have a mutual network because what we put in here is the latest stages of the patients. This is what's happen in Etten-Leur. For the pharmacies we have a network which is called OZIS. The Netherlands has a few OZIS rings (areas), we (in Etten-Leur) are in the ring of the city of Breda. So the hospitals in Breda as well as the pharmacies in Breda (and surroundings) can have access to the latest medication history of the patients. Not all the doctors but only the pharmacies.

B: And the pharmacist of the hospital can look in the system of OZIS to obtain the medication history?

MS: Yes. Every hospital in Breda has an access point for a patients (medication history), so when you go to the hospital they will go to that access point and they look what medicine you have and when they don't know it they ask to your own pharmacy because some of the patients come from Etten-Leur and others patients come from Breda or Roosendaal, etc. When a patient leaves the hospital they will send a fax to the pharmacy with the newly prescribed medication. So OZIS is read-only. In the Netherlands for several years we were trying to make a system which is not read-only but accessible for all pharmacies, all doctors, etc.

B: It's the National Switch Point.

MS: Yes, the National Switch Point. This is not ready (canceled) because of privacy issues and because of another problem which is when you participate in the National Switch Point as doctor you need to put all

the diseases and etc. in a specific way in the computer, because otherwise you cannot communicate properly with the other participants and that would be a problem.

M: With a code?

MS: Yes. And that is the problem because there is no uniformity. The danger of that system is when you access to the National Switch Point and you see the medication, the diseases, etc. from the patient and you think that is all the information, but it's not! Most of the time there's more, so I better know nothing than I just know a half of the information (and draw the wrong conclusions)! When I will think everything is there it's very dangerous! And that is the problem with the doctors. They won't tell you because they say that there is no problem but this is the biggest reason.

M: But the problem is that the doctors don't want to put the codes or they put the wrong code…or they are not sure about the disease?...

MS: The problem with the doctors is when you go to the doctor with some kind of disease they don't know exactly at first what the disease you have but they have to put a code in the system. They put the good one or not? I don't know! So most of the time you need a laboratory, or you need another doctor, or you need some medication first…the first diagnosis are only 60% right! So when you put a code in it…you put a stamp (a label) on somebody with that disease…but it's not always true! And that's one of the main problems! With medication is easier because you sold something or not! So, when the patient doesn't show up it's not in your status.

B: No.

M: But here in the pharmacy, in the community pharmacy, you use the OZIS software or the Pharmacom software?

MS: We use the Pharmacom software and we use OZIS for people who are from Breda, or other cities, and we use OZIS during evening and night shifts. In the general practitioners center, where the doctors are for the night shifts, we have a small pharmacy and they can access to all computers. And they use OZIS. I can use OZIS also because, for example, some people in Breda have a dentist in Etten-Leur and when they prescribe a medicine I can access to the medication history of this patient because I want to know if it's safe to use the newly prescribed medication in combination with the medication the patient is already using. But like I said previously it's read-only, so I can only read it and give to the patient a paper which tells what kind of medication we delivered to the patient and he has to give that to their own pharmacy. And that pharmacy needs to put that information in their computer again.

M: But you can't put that information in the Pharmacom system?

MS: Yes I do, but not in the Pharmacom system from Breda because we have only the 5 pharmacies from Etten-Leur in our Pharmacom system.

B: So, the Pharmacom system is the connection between the pharmacies from Etten-Leur and the family doctors from Etten- Leur (7 of them). And then there is a connection between all the pharmacies in this region (Breda, etc…) and they use OZIS to connect with each other, but that is read-only.

M: Just to read!

MS: Ye, it's that. It's for basic information: what is the latest medication that the patient uses; what are the allergies, which kind of diseases with which you cannot use certain medication, etc. But OZIS is not complete. So you have to ask to the patient, it's your basis (core business) to always communicate with your patient. So this is what we want improve in the Netherlands with the National Switch Point, but it will some more years I think! But on local bases we have a very good system. And I can also access to some of the laboratories, for information from patients when I need to know what the status of their organs (liver, kidney, etc.) is so I can adjust the doses of the medicine. So I don't have to call to the doctor, and I can access to that information and use it. Because our job is to make sure that everything we sell is safe for the patient but also the patient has to need it and we have to give some information to the patient like how to use it the best possible way to make it more effective. That's our job, not only selling medication…

M: No, of course not!

MS: That's the way we make money but it's not only our job!

B: It's part of the job!

MS: It's part of the job! For a pharmacist the most important is the safekeeping of the patients and the delivery of the medication is a logistical problem. That's what we do.

M: About the process of the prescriptions, when the family doctor prescribes the medicine you receives that immediately in the pharmacy?

MS: Yes, when the doctor makes a prescription it goes directly to my printer, where it directly comes out with the barcode. I can see from which doctor this prescription is and for which patient he wrote the prescription. This is the part of the system that we share. This is what he does and he sends that to me and I only have to put it on the (barcode) scanner and I have this recipe. I always have the same patient in my system (after the scan) that he had because otherwise you have to type again and you can make a mistake.

M: And you need to sign this?

MS: Yes, what we do is…one of my assistants will get this medication from the stock and another assistant will control that. Then we also have the control with the barcode of the medication so we have a double control on it. Sometimes also the computer system will give a signal (a contraindication) because, for example, in this case, this lady is breastfeeding so we have to make sure that it's safe for her to use this medication.
After that and when it's done I have to control everything again and put it through the (barcode) scanner again. This is the final process of control system. Then we need to preserve all the prescriptions and put them in a big archive.

B: By law how long do you need to keep all the recipes?

MS: We need to preserve all the recipes for 15 years. So if I need to see some recipe I need to be able to find it in the system because it's almost impossible to find it in the archive.

M: When you deliver the medication to the patient, the box of the medication has a label with information on it. Can you explain to me what this is?

MS: Yes. We put a control label on the box of the medication. I can show to you. On the label you have the name of the patient, date of birth, address, the number of the code from the recipe (each recipe prescribed by a doctor has a unique code), how to use it, some warnings about how to use it and the indications – a small diagnosis (for people that are taking many different medications, to make it easier for them).

M: And the label is printed automatically when you receive the recipe in the pharmacy?

MS: Yes, I scan the barcode of the recipe and I check if everything is ok with the patient and when I see that it's ok, I just need to press "enter" and the label comes out of the printer. In this case we have 3 labels for the medicine because the doctor prescribed 3 boxes of medication, it's an address label, a barcode label for the scanner here and the archive, a control label for me for the end of the day and sometimes a warning label with what I have to do. And this is what we do electronically also, when we get this prescription and the computer says "it's safe to use", for example for the breastfeeding, I need to enter "yes" or "no" myself. I have to logon on to show that I have seen that, and this is only for me to control it.
Because I also have a list everyday with all the signals and everything on it so I have to check if everything is ok and according to how we tell things to our patients.

B: And it's only you that can do the final check?

MS: The final check is for me but the final check for is already checked several times. Two assistants, the electronic check of the packages (the boxes of medication)(that's the third check) and me. That's four controls.
My assistants had an education to be assistants in the pharmacy; they were trained to give explanations to the patients…

M: What kind of study they make?

B: It's not a pharmacy study; it's a study to be an assistant in the pharmacy.

MS: Yes, it's that. They need a lot of time to explain to the patients what they need to do and how to use the medication, etc. etc. So some of the logistic parts are done in Amsterdam (at the central pharmaceutical distribution center of the medication) because we have a lot of work to do…for example, some prescriptions of medication that someone needs for 3 months I send to the central pharmaceutical distribution center in Amsterdam and then in the next day they deliver the medication to us. So we don't need to produce and process the labels for the 3 months ourselves because that takes a lot of time, this is made by robot (automaticly)! With this system my assistants have more time for the patients; I have less stock, which is also better, and I'm never out of stock. It's a rather new system, since three months.
They put the medication in a plastic bag because the central pharmaceutical distribution center in Amsterdam is responsible for what is in the bag. I´m responsible for how the information is going to the central pharmaceutical distribution center in Amsterdam. So I have to check it with my patient first and the only way to do it is to have a transparent bag and you can look through your bag. When something is wrong I send it back to Amsterdam or I correct my own failure when I'm sure that is not a delivery failure. We use this system now for three months for about 2000 recipes a week and we had only one failure.
This is for the chronic medication. This is not for the medication when you're sick and you can't wait another day. When you're sick, and the doctor prescribes your medication, you go to the pharmacy and you get your medication immediately but when you have the same medication for every three months you know these three months in advance.

Well, there are two systems; the system we just talk about is only logistic system. We now also have another new system. Normally, before the new system, when you have your medication every three months you have to call every three months to your doctor for the new prescription, the prescription goes to the pharmacy and you go to the pharmacy to get the prescription. So, when someone has medication for example for diabetes or something like that every three months it's the same medication. Now we're using a system. In the computer I can see exactly when the patient is almost out of the stock so I create a new package for him and I ask the doctor for the authorization. So the patient doesn't need to call to the doctor himself. This is much easier for the patient, it is easier for us as well because I know exactly when I can do the work, it is easier for the doctor because it means less telephone calls and it is also a good system to see if patients are using their medication correctly. For example, when people use medicine, sometimes they forget the medicine or they take two when they need just one, etc. etc. So when we call the patient to say that the new package is ready for him and he says "I still have 5 packages at home", I know, and the doctor knows, that he is not using the medication in the right way.

B: It's a control system…

MS: Yes, it's a control system; in the old situation, before the new system, we only could control the use of medication when the patient was asking for his medicine. When, for example, a patient uses the medication two times a day when he needs to use it one time, he is 6 weeks to early with the question for new medication. I can see that and I can tell you that maybe something is wrong. The other way around, when the patient doesn't show up, because he is not using enough medication, I wouldn't know. And now, with the new system, I know!

M: So you ask authorization to the doctor and then you call to the patient?

MS: We have an authorization from some family doctors, so we made a list of medicines which we can always give to their patients. For some medicines the family doctors always want to see their patients first, so we can't give those medicines automatically. Then we ask to the patient if they like us to call them if their medicine is ready for them, because it's their medicine and it's their privacy, so they have to sign for that in advance. But most of the people like it because they don't have to go to the doctor and wait for a long time there…Now they know that after a week the medicine is ready for them in the pharmacy and they go to the pharmacy when they like. When it's too busy in the pharmacy they come in another day if they like. So, it's better for the patient, better for us, better for the doctor…and better for the insurance company I guess, because we are selling more medicine. Normally 70% of the persons will forget their medicine, always! And with this new system we reduced that to about 40%. So, we're selling more pills, which is more expensive for the insurance companies, but there has been an extensive study on it and it shows that with this new method less patients are hospitalized. So it's cheaper in the end!

M: Yes, the medication errors are lower!

MS: Yes, they are.

M: And it's good for the pharmaceutical companies too!

MS: It's not only good for the pharmaceutical companies but it is good for everybody!

M: The doctors can call to the pharmacy to ask a list with the medication history of a patient?

MS: Yes, they can. But they already know through the Pharmacom system, but just in Etten-Leur. Sometimes when you go to the hospital, not in Etten-Leur, they ask us by fax or telephone. But we always send that by fax.

M: And in those situations, how do they identify themselves?

MS: Most of the times they send a fax with the signature of the patient. Like this we know it is on behalf of the patient. The only reason that we can send medication to a hospital is when somebody (a client of our pharmacy) is in an Emergency room and can't get his medication himself.

M: Is there an institution in the Netherlands witch certify the software that the pharmacies are using?

MS: Well, I don't know. But when you register information about patients you have to tell to the Government that you're doing that and what the purpose and intention of your company is. This is for the privacy reasons. So you cannot get information of clients in that database without telling them what you are doing.

M: And you need to inform that to whom?

MS: To the Government.

M: The Ministry of Health?

MS: It is called the Central Bureau of person registration. As a company, who is starting a database with personal and private information about people, we have to register ourselves at this Central Bureau of person registration. And they have to now all the information about the company and the owner of the database (name, etc.) and what the purpose of the collecting of this data in a database is. In this way, when somebody has a complaint, he can address this institution. And this institution, the Central Bureau of person registration, can always control my work.

M: You just need to tell this institution about your database or ask authorization for it?

MS: You need to tell them what you do and then you will get authorization…or not! For a pharmacy you will get it because for a pharmacy it's a kind of standard…

M: We already talked about the informed consent…do the patients sign?

MS: For this system? No, they didn't. When we started this system we didn't have anything, so everybody was included at first. When you don't want to share your data you have tell to us so we can switch it off and you're out of the system. But this is only for healthcare, because otherwise you have always informed consent first…for your privacy. But sometimes your health is more important than your privacy.

M: When you want to see the medication history from a patient in the software that you use, what kind of information you put to identify the patient (By what way can the patient's medication history is accessed)?

MS: Most of the time we take the date of birth because it's the only thing that never change on the person. His name can change, his address can change…so date of birth is the best way and then you have to check of course if it is the same person and that's why we use the barcode. Because when I'm using the barcode I know exactly that I'm treating the same patient that the doctor saw at his office. When someone comes from the hospital with a hand written prescription that's the big alert for us, because then you have to

choose the right person, the right medicine because with the barcode it is already in the system, with the right medicine. That's why we have a double control on this, then another electronic control and then I control it again afterwards. That's the way we do it. But with one of every five thousand recipes we make a mistake, even when we have 4 controls on that! But most of the times is the wrong number of pills. It's not the wrong medicine, it's only the wrong amount of pills, the patient should have 90 pills and we gave 60 pills or something like that. That's 80% of the mistakes that happen. Giving the wrong medicine happens only ones in about 50.000 times, and that is about twice a year in my pharmacy.

B: And how do you usually find out the mistake?

MS: Most of the time is in my last control, because I check it in the end of the day. But that's why I check the recipes through the day also. So, before the delivery of the medication to the patients I have to check it, so I can find the internal mistakes before the packages with medication are already at home with the patient.

M: Can the patient come to the pharmacy to ask the list of his medication?

MS: Yes. Last year we created a sort of a standard list, and all the pharmacies use that standard.

M: Can the patients come here to the pharmacy for that list or can they also go to the family doctor for that?

MS: They come to the pharmacy. In Netherlands you need to say to your insurance company what is your own pharmacy. You can go everywhere you like but you have to choose one which is the owner of your database.

B: It's a kind of your family pharmacy.

MS: Yes. You can go to every pharmacy you like, but this family pharmacy is the only one which has to make sure that all the information about their clients is ok. And you have to choose it. So, when you go to a doctor and you want a list of your medication there's a standard list which contains the name of the pharmacy, the contra-indications, intolerances for pharmaceutical things, allergies, the doctor which made the prescription, etc. But you have another list, for example, when you're going in holidays.

M: And you can make a list for the last 6 months, last year? You can choose?

MS: Yes, I can choose. In the history of the patient I can see for several years, last 15 years…sometimes longer. Because the electronic database is larger than my paper archive. After 15 years I can throw the paper archive away. So you have the list for the doctor and the list for when you're going in holidays. The last one you have in Dutch and in English. We have also another kind of list for people who are unemployed and welfare. They need to show how much they spend on their medication. And we have another list that is used when you want to buy a house and you need to show a list of your medication for the last 5 years, for example. When a patient asks the list and we (the pharmacy) prints that, we always need to put the reason why we print that for you.

M: And a private hospital can ask to the pharmacy the list of the medication from a patient?

MS: Only with the informed consent. Only when the patient signs for it.

M: They send by fax the signature of the patient?

MS: Yes.

M: And all of the departments of that hospital can ask the list?

MS: Yes.

M: And what kind of medication you have in your database? Just the medication prescribed by the doctor or also the medication without prescription?

MS: Also, but most of the time people don't like it when the doctor can see what they buy in the pharmacy (not prescribed), so I check all the medication that the patient buys but in the system the doctor just can see what was prescribed by him. But when I see that the medication that the patient wants to buy can interact with the medication prescribed by the doctor, I can call to the doctor. So, things that you buy in the pharmacy are not in the list for the doctor. But when the doctor sends a prescription to us I tell the patient that there's a problem with the other medication… maybe they don't using anymore, etc., so there's no problem, but if they are using the other medication every day, then I have to check with the doctor for another prescription.

B: But if I come here to buy a normal box of Paracetamol, the pharmacy doesn't register that in the system?

MS: No. There are a few groups of medication that we are checking, not Paracetamol because you can buy that anywhere but when you want to buy ibuprofen, in a dose which is stronger than 200 mg, the only place to buy that is in a pharmacy. You can go to the supermarket and buy two boxes of 200mg and take two at a time and I don't have any control on that, of course. But normally we have to register. We have six groups of medication which we have to put in the system before we sell that. Sometimes people want to buy that kind of medication but I don't sell it to them because it is too dangerous for them. I can give you some examples: high doses of ibuprofen, some medication to lose weight, medication for nausea, etc. So there are six large groups of medication that we need to register in the system.
In the Netherlands we have drugs in 3 types and you can see the code in every pack of the medication: UR, which means that it is only with a prescription; UAD, which means only pharmacy and drugstores and there is UA, which means only in pharmacies. Medication which is only sold in a pharmacy we always have to put in the system. Most of the times this medication [UA] is safe to use and you don't need the prescription from the doctor but sometimes we need to check. So you have medication that you can buy everywhere, medication that you just can buy with a prescription and medication that you just can buy in a pharmacy.
For example, when you have medication with the code UA you can buy that here in the pharmacy but first I need to check the system for more information about the patient. And before I can sell that kind of medication I have a list of questions that I should ask to the patient.

M: And about homeopathic medication, you sell that in the pharmacy too?

MS: Yes.

M: But those medications don't have these codes?

MS: No, because they are not medication according to the Dutch law. All the medication in the Dutch law has a RVG-number – Register for pre-packed medication.

M: About question 14, which information is available on this list regarding the medication history?

MS: Location Prescription – yes; Date of Prescription – yes; Name of doctor who prescribed – yes; Specialty of the doctor who prescribed – yes, and the hospital too. The name of the hospital where the doctor works.

M: Ok, can it also be the location of the prescription.

MS: Yes. The telephone number of the physician who prescribed and the address too. Date of the prescription; Designation of the medication, Dosage, Pharmaceutical form, Amount of tablets, Posology and name of the patient, address, date of the birth and identification.
And you can see the insurance number too. When we have a prescription, the system checks if the number of the insurance is ok. If the number is ok I can send the bill to the insurance company, if it is not ok you have to pay for the medication yourself. This is because in the Netherlands everybody needs to have a basic medical insurance. But when you're going to a pharmacy and you really need medication, even if your insurance is not in order I have to give you the medication, maybe not all of it but a part, it is by law.

M: I heard about the start of a campaign in the Netherlands that people should always have a medication list with them…can you explain a little how is going to be?

MS: Last year we had a new law that obligates all the pharmacies to use software (like pharmacom) that can create a medication list for the patient. And we (pharmacists) tell to every patient when they go to the doctor "please take your medication list", because the doctor (the specialist) doesn't always have access to our system. The campaign is about that: when you go to the hospital, always go to your pharmacy and get your list of medication.
We have a database of the patient's medication and that's our responsibility, but most important of all, the health of the patient is the responsibility of the patient himself. It is their responsibility and everybody needs to know why they are using the medication they use. When you talk with elderly people and you ask to them why they are taking that medication, they mostly don't know!

M: They don't know and they can't say what king of medication they are taking.

MS: Yes, they say "I take the white pill in the morning and the blue pill in the evening"! But we are trying to do something about that. Next year, when we'll start the medication reviews with people that use more than 6 medicines, when they like, we can ask the patient why and how they are using their medicine…and then talk with the doctor…maybe we can make it easier for the patient…Doctors and specialists treat diseases. We like to treat the patient as well!
Because with all the medication distributed by the pharmacy we have to check on the patient if everything is ok, if it is safe and also if this patient can take this medication and if it is possible to use that medication for this patient. If it's not possible we need to take action and help the patient. Because we are, like the doctors, by law responsible for the effectiveness of the treatment. So we are not only selling safe drugs, which we do, but also selling to people medication that is good for them and good for the disease. And if it is not, we must not sell that medication and take action towards the doctor. That's our job!

M: Thank you for your time and cooperation with the research for my study. I will make a transcript of the interview and would like, if possible, to get your feedback. Do you agree with that?

MS: Of course.

M: Can I have your contact information to send you the transcript by e-mail?

MS: Yes, I will give you my card.

M: Thank you once again.

B: Thank you very much.

MS: You're very welcome.

Interview with Dr. Lily Heijnen – Program Manager Amphia Ziekenhuis
Breda, province of North-Brabant
November 9, 2011

L: Lily Heijnen
M: Margarida David
B: Bart Wouters (interpreter)

Notes: The interview was tape-recorded with the authorization of the interviewee and the interpreter.

L: We are implementing our EMR (Electronic Medical Record) but the medication is for the next phase, so we haven't yet implemented the medication.

M: The electronic medication records?

L: Yes.

B: We also had a conversation with Relin Verzijl this week Monday, and she told us that they are very busy to try to build the module in EPIC for the pharmaceutical department.

L: We just started the project group to implement the electronic prescription module.

M: But it's just going to start in January 2012 in the Netherlands?

L: Yes. We should, but we asked for a delay, so in Autumn next year (2012) we want to have it implemented in all departments of the hospital.

M: In Portugal it was the same, but we are already working with electronic prescriptions. In Portugal the doctors have some exceptions, for example, if the doctor visits the patient at home, in that case they don´t need to make an electronic prescription. Is this the same in the Netherlands?

L: Here is an obligation to all the doctors. And of course if the system is not working we have an escape on paper, we always need to have an escape in case of a calamity. But is our point of view that, once we implement the electronic medical record and prescription, everyone is using it, so there are no exceptions.

B: And then the goal is to have an entirely paperless system? But isn't necessary for the prescriptions to be signed by the doctor or the patient?

L: No. Then you make a prescription in by the system and you sent it to the pharmacist by the system, then if you signed within the system is alright. So when you look into ordering inside the system before the order goes out they have to use a button that says signing, so when a nurse puts the order in, and press the signing button, she gets a screen where she as to put in the responsible physician. And then you look at medication and there's some registrations from the ER, when you click on the button signing you have to give your password again. So you are sure that the physician himself the responsible. This is one of the restrictions of the system that is built in. And then it isn't necessary to have any signature on paper or the prescription.

M: And all prescriptions are going directly to the pharmacy?

L: Well that is our goal. I don´t know how far we will be in the Autumn, but that is our goal. The clinical prescriptions go to our own pharmacist, and the polyclinic prescriptions we have to send to the pharmacist of the patient and is our intention to make that electronically, but I don´t know if we have already the connections in place at the end of the year. Yesterday I heard on the radio about the cancelation of NICTIZ so I was very disappointed because otherwise we have made the connections to the National Switch Point, for now it's canceled. It takes so long in the Netherlands to arrange this kind of things, and I thought it was a good feature because then you could send it from the system to the right pharmacy and the patient goes to the pharmacy and his medication is already gathered together (and ready) so the patient does not have to wait and can take it with him immediately. And I think it's much better. In this way you don´t have the probability of two times writing where mistakes can happen, wrong doses etc. It's so simple to make mistakes, is only human. So I´m very disappointed.

B: This is where medical safety of persons collides with privacy issues.

L: Yes. Yesterday I was at a symposium where the Federation for Patients Rights and Interests in Healthcare held a presentation. Their opinion was changed. They now defend that kind of connections. That I heard first and then, sitting in my car, came the bad news on the radio about LSP (National Switch Point).

B: It was a money issue not privacy issue that canceled the program.

L: At first was a privacy issue, and NICTIZ didn't get the right connection, so pharmacies, GP's and hospitals didn't want to join LSP. And then government ordered to the LSP that they had to make (built) their own customers, and that they had to be friendlier to their customers. So has a hospital, you think this is a lot of money as investment; you want to make sure that your investment is paying off and running perfectly. They have been working already for a year on the functionalities and they did not get it right yet. So hospitals, GP's and pharmacies said "we will pay for the service when it is ready and functioning", so in the end that´s why the program stopped.

L: So I think that will be a new initiative, now everyone is working on the regional connection system…but that is not the solution.

B: No, regional is not the solution.

M: But it's also good…

L: It is a start…

B: It is a start…and you have the connection between the regional hospitals and the pharmacies in the region…

L: Yes, but when you look at our region we have cities, because ours, is a very large hospital, so we have a very big region where our patients are coming from, there is lot of cities and villages that do not fall into that "region"…so you still have a big percentage of patients that are not connected to the system.

M: So (in fact) it´s more local than regional…

L: It's a bit regional, but there's always the problem and challenge to determine where a region starts and what areas it includes…so that's one of the problems…

B: Yes. We understood from our interview with Relin Verzijl that the doctors and pharmacists from the hospital can look into the system of the regional pharmacies but not contribute (add data).

L: Yes.

M: So, as a resume, to see if I understood, there is not a national system yet, just regional or local.

L: Yes…and it's not working yet and we are still building it…

M: But doctors (in this hospital) can have access a list of medication history from a patient?

L: Only the history existing in this hospital, at the moment. Not from GP or another different hospital.

M: But they can ask for the list at the pharmacy?

L: No…when a patient is coming for the first time to this Hospital, to a physician, then he asks the patient about his medication, so he relies on the information provided by the patient.

M: I understood that they could ask the pharmacy…

L: No they don't do that now. Only when we have an admission of a patient then the pharmacist's assistants have a conversation with the patient. They will ask permission to ask the information to be provided to the hospital on behalf of the patient. But this doesn't apply for the normal polyclinic visits.

B: Ok, so the hospital pharmacies can ask for information only when a patient is committed.

L: And not in ambulatory admissions. Because then there's too much paper work to be filled.

M: And in the Emergency Department?

L: In the ED they are obliged, when patient is discharged, to give a notification to the pharmacist of the patient and we (this hospital) do that on paper now (at present).
So the hospital pharmacy is making a written notification to the patient's pharmacy, about all medication that he should use at home.

M: And the medication that was used in the hospital during admission?

L: No… not the medication that was used in the hospital, only the medication that the patient is going to continue to use at home. There isn't yet an electronic way of exchanging information, so it is a lot of manual work.

M: Have you received the list of questions that I´ve sent you?

L. Yes. I have not read them all, but can we go thought it now?

M: First question…in which way can doctors have access to the patient medication information?

L: We have already talked about it.

M. Second question…I know that pharmacies don't have installed, or use the same software…but as far as I know, in the Netherlands there is an institution that certifies the pharmacies software? Is there a kind of list?

L: No…They certify the medications lists… and you (doctor, hospital, pharmacy) are obliged to use a table (chart) for medications.

B: Ok and do you know which institution does that?

L: Did you ask Relin Verzijl?

M: Yes, but I don´t have that information with me…

L: She knows the right name. It's the G3 Standard, I think…It's a typified and we are obliged to use it. You can find it on the internet. I don´t think there is an official institution that certifies our software, we have been working on that with our commercial assistant to certify it and we couldn't…so we make sure that he is using this G3 standard chart. Every month this G3 chart gets updated with new recommended medicines and their interactions and information, etc…

B: We have been talking about it before, not in the same context. Relin Verzijl was talking about it. A sort of national database. That´s the G3 standard?

L: Yes… that is the G3 Standard…

M: So the system is regional and local…this is the 3rd question…

L: You can say it is national…if you make a phone call to the pharmacist on other side of the country and you can get an answer, then you can call it national…but…

M: But the information is provided only by patient's consent…

L: We have a kind of network but not all hospitals (throughout the country) are using it, it´s very old and not all pharmacists are connected to it…

B: Under what name?

L: It is OZIS…

B: Yes…the regional network…

L: Yes.

B: In OZIS…Pharmacists can access each other's medication histories of patients?

L: Yes…but not the hospital pharmacy, only the local pharmacies in town.

B: Only the local pharmacy?

L: Yes.

M: Fourth question…is about informed consent.

L: But aren't using it yet, so we haven't worked it out. We didn't look into it because we still don't have the connection (software)…

M: Question twelve: For how long should the information about patient's medication stay in the system?

L: I think now is 15 years, and University Hospitals have the obligation of keeping data for 115 years. This is for University Medical Centers, and not for all documentation but for the most important, because you had that obligation on documents on paper and at present everything has been scanned to save the information…maybe the 15 years applies also for medication, but I'm not sure. But we don't throw data away. Until now we didn't throw anything away…
If it was digital you don't need to…digital information we don´t throw away. Maybe the problem in the future will be less, because systems are "growing" faster than your data is "growing".

M: When the electronic prescription record system will be ready, what kind of medicines and medications you think will be included the database? Just the medication prescribed by the doctor or also for example paracetamol, which you buy over the counter.

L: All of that will be in the system.

M: And homeopathic medicines…etc…?

L: I think it will all the medication that exists in the G3 Standard and medications prescribed by physicians …Sometimes you have local medicines that the pharmacist is making himself, and that will also be in the system. So when there are any interactions all that will be put into the system. Because we want to have a total overview. I don't know about the homeopathic medication and so forth.

B: But is also hard or impossible to control what patients are buying without prescription?

L: That is not that important, so it will not be put in the system, only what was prescribed by a physician. What you want to see is only that, not what the patient is buying himself.

M: But it will be what is prescribed only or what is prescribed and dispensed by the pharmacy?

L: Yes. Prescribed and dispensed by the pharmacy.

M: And medication prescribed at the Emergency Department?

L: Yes, that also will be put into the system.

M: And for example some medication administrated in the Emergency Department? Will that be also in the system?

L: Yes. That will be also being put in the system…so you can always look back on what medication the patient got at the ED. At present that data is recorded on paper, but it will go in the system in the future to keep a record of what was administrated in the ED. Like that you will have a total view of what was done with the patient.

M: So here in the hospital you are going to work with EPIC and in that system there is all that information?

L: Yes.

M: That information is going to the database of medication history?

L: Yes, in EPIC.

M: So that is one module from EPIC?

L: Yes. We have an application integrating the EMR, the database consists of documentation of ordering and also of medication. It's a long big database. The total patient history should be in the database. That's our goal.

M: Could it be a different application that could pick up other pieces of information from other databases?

B: From what I understand it is a one big database with all the information in it. On top of that database you have several layers of authorization, that gives, or gives not, access to its different users.

L: It is a complex authorization system, but we are working on it. Every department has its own rules and restrictions. We are working on it because privacy of patients is important, but also to have the right information to provide treatment for the patient.

M: Can you confirm if the patient can request some information to be deleted from the system?

L: Yes. There are some restrictions. Someone in the hospital knows all the restrictions. When a patient wants some information to be erased, we have to delete it. It is the right of patients. On the other hand the physicians are obliged to do the documentation, that is also the law, so there's a conflict here…

M: But for that to happen, does the patient have to sign anything?

L: Yes. The patient has to sign a paper declaring that he wants the information deleted, so afterwards he can't claim that the information was wrongly deleted. We have a proper procedure for that.

M: And the patient can chose which physicians can have access to the information on him?

L: No. When there is a treatment relation (between patient and doctor) the physician can see the information and when you don´t have that, like the first time in the ED, the physician have to get a notification requesting it, after the system asks the reasons for the request on that information…This is to protect the patient, and to know who has been looking into patient information…etc.

M: And about the information that is going to stay available?

L: That is too much detail for me…I'm the e Program Manager. Relin Verzijl will know more than me.

B: We would like to know more about the project as a whole. How this works in a big hospital like this.

L: This is a big project and has a special place in the organization, directly under the director's board. It isn't an IT project but an organizational change project. Because de work of everyone is changing and a lot of processes and procedures are changing, and IT is the department that supplies the technical support for this change so IT is important but it´s not leading, just supporting, that's why we have a separate program organization, which I'm directing. I built up my own organization group with 16 projects groups, and we have 3 phases. In the first phase migrated from our old system to EPIC, at the end of May this year (2011), and all the functionalities that were in the old system migrated to the new system. We also improved the processes because the new system has more possibilities than the old system, and the new functionality was the possibility to order everything. Now we are putting in order almost everything, not medications and nurse's orders, that's for the next phase. Now we already have the orders from the lab, radiology, patient's admissions and surgeries. All those papers already disappeared from the hospital it was a lot of work and a very big change. For more than 4000 employees, at three locations, the work methods changed in one day…

M: And the company that developed EPIC. Do they come in here, to the hospital?

L: Yes, they don't come often, and that's good, because at the beginning my team was inexperienced and EPIC did support more, but now that we gained experience …in the first phase EPIC was leading, then my staff was trained and then they took over the jobs from EPIC, we want to get to the point that we don't need to request their expertise.
They have a good implementation strategy, and very good step by step plans to implement things on time, which we follow closely. They are very organized. I never worry about the planning or scheme, they are very good at their job. Every project or module has its own planning and we work on it, the only thing we do is to intervene on the planning when something needs to be applied differently.
Once a week every team that works for me has a meeting by phone with their counterpart from EPIC to discuss planning, progress, problems… In cases where something is too advanced or new and my team is not ready to do that, EPIC comes here and works together with my team, so my team is learning. From the moment the first phase of the system was taken in to use most issues were solved by my own team, only when there's doubt about the system, EPIC will be contacted. In the first 2 weeks we had a big staff of EPIC here, a command center, this was our command center and my team and EPIC were working together in the first two weeks to solve all problems and then the support came from Den Bosch, the city where EPIC is situated, and then my team does all the work here in the hospital.

M: We were talking about the first phase… and about the second phase?

L: So the 1st phase was our migration and ordering and the Emergency Department is now completely electronically controlled, so all documentation is filled into the system. So that now is completely electronic. The ER has patient registration (for new patients), and all procedures required by law are built in until billing. So we also use the EPIC system to bill our patients.

B: So it´s a complete system?

L: Yes. And we have more than 100 polyclinics and they are now all included. They also went on the same day to the schedule module of EPIC System. I've never done this so fast as in other projects like this in several other hospitals. This time it went very fast…
Also other different departments, around 110 or 115 departments in total, started on the same day. That was incredible…when I read the figures I´m amazed myself. And only with 20 staff members to do it and we also did all the trainings, they also did the training plans…40 different ones, they built the system, they made hundreds of test scripts, they tested the system together with the key users and they also trained more than 4000 hospital employees...So we trained for seven weeks from 8 a.m. until 10 p.m. in the

evening, in 8 training rooms. And yesterday I was at the symposium and was asked to tell about our implementation and someone in the audience said that it sounds like a luxurious to have 20 application coordination staff members!

B: But that´s all Phase 1?

L: Yes. And we are now preparing Phase 2. We are going to do the documentation for physicians, nurses, physiotherapy, all are changing to electronic documentation, from medication prescribing and also the admission of medication, they make a notification when a patient in the clinic gets his medication, so you are sure that the medication is taken, because prescribing won´t say that you really toke it, so you will know what the patient is taking.
We are going to implement anesthesia module in the ER, radiology and the nuclear health care are going to use the EMR, now they have their own system and now they going to work with the EMR, so we have a total integrated schedule possibility. We are still working on the DBC´s.

B: What's a DBC?

L: It is a Diagnose and treatment combination, where we have to declare medical procedures and it is for billing. Something like the DRG´s – the Diagnose Related Groups, I don´t know if you use it in Portugal? They use it in Belgium, in the USA and Australia. We have here the DBC. But now that is also it's changing…we are working on the billing system to fit the new DBC structure.
We want to improve the way we schedule to make more combinations so the patient can have all appointments in one day correctly.
We are in conversation with the GPs so they can exchange information with our physicians.
We are going to look at the possibility to give the patient's access to the EMR, so he can look at his own records and fill in the questionnaires. In the future he even can make his own appointments.

B: But that´s Phase 3, maybe?

L: Yes. We are looking into possibilities in phase 2 and then work it out in to Phase 3. It´s a lot of work. It is very complete system.

M: Thank you for your time and cooperation with the research for my study. I will make a transcript of the interview and would like, if possible, to get your feedback. Do you agree with that?

L: Of course.

M: Can I have your contact information to send you the transcript by e-mail?

L: Yes, I will give you my card.

M: Thank you once again.

B: Thank you very much.

L: You're very welcome.

Appendix VII

Example of an interview transcription feedback

From: **Margarida David** <guida.david@gmail.com>
Date: 2012/8/30
Subject: Transcript Interview for Master Thesis, Margarida David, Portugal
To: rvdinter@its.jnj.com

Dear Dr. Renier van Dinter,

First of all I would like to thank you once again for your participation and collaboration in the research for my Master's Thesis with the theme “Accessibility in the Emergency Department to patient's medication history”. The concluded interview was very precious for understanding the reality of this subject in the Netherlands.

Right now I’m very busy with writing my thesis, which needs to be finished by the end of October.

Due to overwork, only now I have the opportunity to send a transcript of the interview, and I want to express my sincere apologies for the delay.

I would be very grateful if you could read the transcript of the interview, and if you think necessary, correct or add any relevant information. It would be also interesting if you could inform me about the current situation of the LSP - National Switch Point, in the Netherlands.
Once the interview was made a while ago, I’m sending attached the Question List.

I would like to inform you that if you need any clarification you can contact me or Bart Wouters at any time.

Thank you very much in advance.

Best regards,

Margarida David
E-mail:guida.david@gmail.com
Telephone: +35196 4134466

Bart Wouters
E-mail: barwou@gmail.com
Telephone: 06 53964501

2 anexos

From: **van Dinter, Renier [JACNL]** <rvdinter@its.jnj.com>
Date: 2012/9/3
Subject: FW: Transcript Interview for Master Thesis, Margarida David, Portugal
To: Margarida David <guida.david@gmail.com>

Hi Margarida,

please find my feedback. I think it was a good summary.

Al the best with your thesis!!

Kind regards,

Renier

From: **Margarida David** <guida.david@gmail.com>
Date: 2012/9/7
Subject: Re: FW: Transcript Interview for Master Thesis, Margarida David, Portugal
To: "van Dinter, Renier [JACNL]" <rvdinter@its.jnj.com>

Dear Renier,

Thank you for your reply and the remarks on the transcript. With these remarks I can improve and finalize the transcript of our interview.

I would be very grateful if you could inform me about the current situation of the LSP in the Netherlands. During the interview (which has been conducted in November last year) was told that the Government canceled the project due to privacy issues. Have been there any developments in relation to LSP?

Once again thank you for everything and I will send you a copy of my thesis when I have finished it.

Best regards,

From: **van Dinter, Renier [JACNL]** <rvdinter@its.jnj.com>
Date: 2012/9/11
Subject: RE: FW: Transcript Interview for Master Thesis, Margarida David, Portugal
To: Margarida David <guida.david@gmail.com>

Hi Margarida,

current situation is that the Ministry of Health has transferred the LSP to a separate organization called Vereniging van Zorgaanbieders voor Zorgcommunicatie (VZVZ).
http://www.vzvz.nl/page/Home/Zorgverlener

Planning is that in the end of 2012 the VZVZ will start a campaign towards patients to ask their permission to include the patient data in the LP (by Opt-in).

The project will then start in 2013.

Currently the Ministry of Health has stepped out, but is (financially) supporting the effort of the VZVZ.

The law in the Netherlands already gives opportunities to transfer patient's medical history electronically.

Question will be how many patients will opt-in and what kind of publicity will be generated (positive/negative??) that will influence the number of opt-ins, and thus the success of this new initiative.

Kind regards,

Renier

Appendix VIII

List of hospitals which authorized the questionnaire and their respective number of answers

Group number	Name of the Hospital which authorized the questionnaire	Total of physicians that has been given access to the questionnaire	Total of answers	Authorization and disclosure procedure of the questionnaire
101	Unidade Local de Saúde de Matosinhos (Hospital Pedro Hispano)	46	28	The researcher received authorization from Board of Directors of the hospital. After a meeting with the ED Director to explain the subject of the research, the questionnaire has been released on January 23, 2012. The researcher has visited the ED physicians several times to explain the purpose of the research and to motivate them to reply the questionnaire.
109	Centro Hospitalar Cova da Beira (Covilhã)	27	*	On 7 February, the researcher has received an e-mail from the Secretariat of the Board of the Directors with the request to clarify some questions as presented by the ED Director. The researcher has sent an e-mail to the ED Director to clarify the doubts. The questionnaire was available on April 2, 2012 to 27 doctors that perform functions in the ED.
103	Centro Hospitalar do Barlavento Algarvio (Portimão)	37	3	On December 30, 2011 the researcher has received an e-mail informing that the questionnaire has been authorized by the Board of Directors of the hospital. On January 19, 2012 the researcher was informed by email that the questionnaire had been available only to ED General Physicians. After contact with the hospital, the researcher was requested to ask authorization again to the Board of the Directors so that the questionnaire could be also made available to other specialties that perform functions in ED. On February 17, the researcher was informed that the Board of Directors did not authorize the questionnaire to physicians from other specialties, since there was no availability from the physicians and from the hospital services to satisfy the request.

Group number	Name of the Hospital which authorized the questionnaire	Total of physicians that has been given access to the questionnaire	Total of answers	Authorization and disclosure procedure of the questionnaire
108	Centro Hospitalar de Trás-os-Montes e Alto Douro (Vila Real)	Without access to this information	16	On February 14, 2012 the researcher received a letter stating that the questionnaire had been authorized by the Board of Directors of the hospital. After authorization the researcher contacted by phone several times the secretariat of the Board and the informatics service of the hospital. On June 28, 2012 the researcher was requested to send an exposure addressed to the Board of Directors clarifying that the request for the study had been approved and that the opinion of the ethics committee had been favorable. The authorization to conduct the release of the questionnaire to the emails of the physicians however was missing. The researcher received an e-mail on July 3, 2012 from the informatics service informing that the questionnaire has been disclosed to the ED physicians.
113	Centro Hospitalar de Vila Nova de Gaia/Espinho	Without access to this information	15	On June 26, 2012 the researcher has received an e-mail, from the Training Education & Research Service of the hospital, informing that the questionnaire has been authorized by the Clinical Director of the hospital. The investigator contacted the Training Education and Research Service by phone and was advised to articulate with the ED Director. After contact with The ED Director a meeting was scheduled. On July 2, 2012 the researcher has been present in the ED with the Director and met with the ED physicians.
120	Centro Hospitalar Leiria-Pombal	Without access to this information	8	On 4 July 2012 the researcher has received an email informing that the questionnaire has been authorized by the Chairman of the Board. After telephone contact with secretariat of the Board the researcher had to articulate with the ED Director. Since it was impossible to get in contact with the ED Director, all issues related to questionnaire were treated with the ED Secretary. On July 12, 2012 the researcher was informed by e-mail that the URL was already available on the hospital intranet for all ED physicians, because not all physicians had an institutional or personal e-mail.

Group number	Name of the Hospital which authorized the questionnaire	Total of physicians that has been given access to the questionnaire	Total of answers	Authorization and disclosure procedure of the questionnaire
123	Unidade Local de Saúde de Castelo Branco	4	1	The researcher has not received an official authorization of the Board of Directors. On June 14, 2012 the researcher merely received an email informing that the questionnaire has been released to four physicians. After receiving the e-mail the researcher has contacted the secretariat of the Board of Directors by telephone and was informed that the request for conducting the study has been authorized.
133	Centro Hospitalar do Oeste Norte (Caldas da Rainha)	84	5	The researcher has not received an official authorization of the Board of Directors. After verifying that she had responses from this hospital to the questionnaire, she contacted the secretariat of the Board of Directors. They reported that the request for authorization has been forwarded to the Communication and Image Office, which was subsequently contacted by the researcher. In this contact the researcher was informed that the request has been approved and the questionnaire has already been released to the ED physicians. The researcher received an e-mail on July 17, 2012 informing that the questionnaire link was sent to 84 physicians.
105	Hospital Distrital da Figueira da Foz	23	*	The researcher received authorization of the Board of Directors on December 27, 2011 by email. On that date the hospital issued an Information Circle for the release of the questionnaire to all ED physicians. The text, written by the researcher, with the theme and purpose of the study and respective questionnaire URL were also attached.
138	Hospital de Faro	Without access to this information	*	The researcher received permission from the Board of Directors by e-mail on July 11, 2012 (e-mail from the Hospital Research Unit). For clarification the researcher has contacted the Hospital Research Unit. They suggested to get in contact with the ED Director. The researcher tried to contact the ED Director (by phone) several times, without success.

Group number	Name of the Hospital which authorized the questionnaire	Total of physicians that has been given access to the questionnaire	Total of answers	Authorization and disclosure procedure of the questionnaire
150	Centro Hospitalar do Tâmega e Sousa (Penafiel)	Without access to this information	*	The researcher received permission from the Board of Directors by letter in March (dated March 8, 2012), annexing the view from the Ethics Committee. They had no objection to the study, however they presented some considerations that the researcher should take into account. She also asked the concordance of her thesis advisors. The researcher contacted the President of the Ethics Committee by phone and, as requested by him, sent an email with the faculty declaration and the names of the master thesis advisors. In June (letter dated June 5, 2012) the researcher received full approval for the study. Several times the researcher tried to contact the ED Director without success.
106	Hospital de São João	Without access to this information	*	The researcher received the view of the Ethics Committee by email on February 28, 2012. In this email they stated they had no objection to the study. However the researcher should contact the Director of the ED. Several times the researcher tried to contact the ED Director (by phone and in person) without success.
111	Unidade Local de Saúde do Alto Minho (Viana do Castelo)	Without access to this information	*	The researcher has been contacted via telephone by the ED Director on January 27, 2012 to inform that the study was authorized. The ED Director also informed that not all the physicians had institutional or personal email. After contact with the Hospital Informatics Service the only feasible solution was to put the URL available on the computers in the physicians' room from the ED.
104	Hospital Infante D. Pedro (Aveiro)	Without access to this information	*	Authorized on June 11, 2012 through e-mail. The researcher tried to contact the ED Director several times by phone and the last contact was via e-mail on July 17, 2012. On this date the respective URL of the questionnaire has been sent again.
110	Centro Hospitalar do Alto Ave (Guimarães e Fafe)	Without access to this information	0	Authorization on August 6, 2012 through e-mail. It is not taken into consideration for the study because the data were collected on July 31, 2012.

Group number	Name of the Hospital which authorized the questionnaire	Total of physicians that has been given access to the questionnaire	Total of answers	Authorization and disclosure procedure of the questionnaire
Not identified	-	-	7	For a nonspecific reason the URL, sent to one or more hospitals, did not specify what it should. It is also possible that some respondents, in an attempt to access the questionnaire, have copied only part of the URL. If the URL does not contain the information that corresponds to the group, it is impossible to identify the respondent.
Total			**n=83**	

***** For a nonspecific reason the URL, sent to one or more hospitals, did not specify what it should. It is also possible that some respondents, in an attempt to access the questionnaire, have copied only part of the URL. If the URL does not contain the information that corresponds to the group, it is impossible to identify the respondent. It became impossible for the researcher to place the number of responses, corresponding to certain hospitals, in the table above, since the group could not be identified.