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E-Prescribing

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As Europe moves from national healthcare IT programmes towards full-fledged e-Health services, many experts see e-Prescribing as a key foundational step. There is a strong business case, accompanied by equally strong perceptions, that improving the prescribing and medication management process with IT will directly reduce errors, increase service quality and the delivery of effective care across the spectrum. Given below is an analysis of e-Prescribing in the Netherlands.

National Programme For Pharmacy

Nictiz - the National IT Institute for Healthcare in the Netherlands was founded in 2002 by the Dutch government to improve healthcare processes through the use of IT. The organisation laid down their plans for a decentralised national infrastructure based around a National Switchpoint, but of course an infrastructure by itself has no purpose, unless it has content. Therefore, the first focus of Nictiz was the pharmacy domain, because its use was widespread through all levels of healthcare. Implementing this domain would imply that a major chunk of the healthcare sector would need to connect to the national infrastructure.

The Dutch national implementation started with the medication history of patients. The history is based on dispensing information retrieved from community pharmacies. The rollout of this project is currently active and is carried out by IT vendors and professional associations under supervision of the Ministry of Health.

Nictiz itself is already occupied with additional functionality in the pharmacy domain, which is grouped under the rubric of EMD plus.

E-Prescribing

E-prescribing is the next functionality which Nictiz is planning to implement.

There is probably little need to explain the benefits of e-prescribing in detail. Most readers would have come across various articles explaining the advantages of electronic prescribing with arguments such as:

Ó Preventing transcription errors of unreadable handwritten prescriptions.

Ó Improving medication safety by cross-checking on double medication, contra-indications, dosage and medication interactions at the moment of prescribing. Preventive checking is more effective than medication safety checking at the moment of dispensing.

Ó Logistic improvements and lowering in the costs of handling. With first time prescriptions the gain is not so significant, because in general the prescriber would note down a generic drug name and the pharmacist would still need to do some manual handling to select an appropriate brand name. However, with repetitive prescriptions the handling would yield tremendous logistic advantages.

Currently, most GPs in the Netherlands are already registering their prescriptions electronically, although some still print it out and give a printed version to the patients and/or fax it to the pharmacy.

Once such prescribers become used to the computer, it will be regarded as a small step forward to send the prescription through a network. Seventy to eighty percent of the volume of all prescriptions are repeat prescriptions and these are often generated by the GPs.

Moving the Laggards

So the key question in the Netherlands is about those yet to begin prescribing electronically and what would be the benefits in getting the last of the Mohicans behind a keyboard. Surveys show that specialists, giving consultation to patients in a ambulatory setting or day care, are still reluctant to use electronic devices to enter patient data.

Unlike a GP who generally has the workstation on a desk in the consultation room, it is the mobility of the specialists, running from one consultation room to another, which prevents them from sitting down behind a workstation. Currently, it is easier for a specialist to jot down a written prescription, than taking his or her place behind a workstation to register an electronic prescription.

For patients in an institutional setting, the circumstances are different. A team of nurses, assistants and institutional pharmacists form the backup for the doctor to help the prescriber with the registration of medication information.

Medication safety is still the key driver in order to get this last group to make electronic prescriptions.

In the Netherlands, it is customary for patients to be treated by a GP in the first stage and only consult a specialist after referral by the GP.

There are chances that patients are in a more serious or complex condition than would be the case if the GP would treat the patient himself. Dosage of the medication could then be more critical and therefore cross-checking with the help of computerized software would be more essential.

What are the functions we want to introduce in the Netherlands through the national program? The e-prescription will be equipped with an electronic signature from the prescriber, thus making the paper version obsolete.

Secondly, the reason for prescribing will be included in the prescription when it is necessary, providing the pharmacist with essential information for the correct dosage. This is mostly the case with multiple purpose drugs.

The Electronic Signature

The requirement for a signature on a prescription is based on common European legislation. The Dutch version of this law has been renewed to accept an electronic signature as a valid token from a recognized prescriber.

Signing data might seem straightforward, but there are certain pitfalls in the choice of the signed data. In the basic method, the process of signing data and the generation of the message or document are handled at the same software level.

However, this is often not the case in hospitals. The workstation on which the prescriber is signing off a prescription is generally a different software layer than where the document or message is generated. Messages or documents are generated by communication engines. This means that certain coded elements which have to follow certain messaging conventions are not (yet) available at the moment of signing. These conventions are either XML or HL7v3 conventions. An example is the dosage instruction which is transferred as a complex GTS (General Time Specification) datatype.

WYSIWYS: What You See is What You Sign

Given the above reasons, Nictiz has regarded the intent of the prescriber as the focus on which the signed data is to be signed. In other words “what you see, is what you sign”. This choice means that the prescriber has to understand what he or she is signing.

In many cases, coded elements (for example a product code) could be meaningless for a prescriber. It is often the case that a user selects through a data-item by picking out a displayed text without seeing the code that is generated in the software. Therefore, the displayed text is regarded as leading, as compared to the coded data in the signed fields. The coded form is merely attached to make computerised checking possible at the receiver’s side.

However, if any discrepancy between text and code is found, then the signed text will be regarded as the rightful signed data.

Closing the Gaps

There are still certain matters to address with regards to the use of electronic signatures with prescriptions. The electronic signature is mainly a method to identify the rightful origination of the prescriber. It is basically focused on securing the transfer of signed data and much less the uniqueness or the persistence of the document. The verification of the validity of signed data is valid as long as the certification of the signature still can be recalculated. The chipcard of the prescriber is valid for a period of three years. This could mean that a prescription, that is signed at the end of the validity period, would appear as non-valid if checked shortly after the end of the validity of the card. The chances, however, of the need to review a prescription by the inspection are almost nil and the question is how far do we need to take measures to address such rare situations in advance.

A copy of an electronic file is indistinguishable from the original and an electronic signed prescription would be just as valid as the original signed document. This is where the Dutch national infrastructure, called AORTA, comes into place to prove the uniqueness of issued prescriptions.

The core of the national infrastructure is the National Switchpoint. The switchpoint not only logs and identifies correct transactions, but also takes care of proper routing of all transactions. All electronic prescriptions which are transferred through the National Switchpoint will be registered in the index and therefore secure uniqueness of the signed prescriptions.

Guidelines on Medication Profile

Once e-prescriptions are introduced, then of course it will be possible to place queries and retrieve information from the various sources. Quite recently the guidelines for transfer of medication care were brought out by the various professional associations.

These guidelines describe the medication profile consisting of prescribed, dispensed and administered medication as well as contra-indications as the basic set of information when patients are transferred from one care-provider to another.

Therefore data elements, such as prescriptions, need to be implemented electronically, at first in a standard way before a consistent report can be understood by receivers. Standard product codes such as the Dutch G-standard from Z-index and a common terminology on contra-indications form part of understanding each other. Dosage instructions are also transmitted in coded form so that computer intelligence can perform medication safety checking.

Interventions

Once electronic prescriptions are available, the need for intervening on the prescription will be necessary. Of course, the phone is always there for emergency cases, but more often getting in touch with the responsible prescriber can be a time consuming effort. Users have underlined the need of an electronic intervention to optimise the support of the electronic prescription process and to report a reliable medication profile of the patient. For reliable reporting, a meaningful registration of the time interval in which the prescription is active is important.

Underlying this need is the philosophy that the prescription is in essence not only logistic order to supply medication, but an agreement between the prescriber and the patient to follow a certain therapy. In fact stakeholders have suggested that a prescription, which consists of both a dispensation information section as well as one on administration instructions, could contain only dosage instructions with a zero supply, if the prescriber and the patient conclude that the patient had enough stock in his possession and only required to change the dosage.

To be able to signal changes, an intervention message is available to pass on the modification in the therapy. The use cases are:

Ó The original prescriber nullifying or adjusting the therapy of his or her own prescription to notify or alert the dispenser of the change.

Ó Another prescriber notifying the original prescriber that a patient is now in his or her care and that the therapy had to be changed.

Ó A dispenser requesting the original prescriber to provide a new prescription, because of issues discovered with the original prescription.

An example of the second use case is where a patient is institutionalised and discharged from hospital. These moments of transfer are often precarious moments, where until now the lack of information has led to hazardous situations on medication safety. If the instructions to the patient or attending family or personnel are not clear, it could end up with double medication or improper dosages.

Future Plans

Nictiz still has ambitious plans for the future. Currently all electronic prescriptions are being pushed from a prescriber to a dispenser. The advantage of this method is that prescription can be checked and prepared long before the patient or representatives arrive at the dispensary. Specialists in hospitals are not inclined to ask a patient to which dispensary the prescription should be sent.

Above that lies a strong political requirement, that freedom of choice for the patient for the pharmacy should be taken into account. Patients would choose a pharmacy first, identify himself or herself and request the pharmacist to retrieve the prescription from the source. This would

reverse the flow of the prescription, indicating a pull mechanism rather than a push mechanism.

Pharmacists argue that changing pharmacies frequently is not in the benefit of supporting the patient on medication safety and that a patient should have a fixed pharmacist. It is likely that both scenarios need to be supported. Young and healthy people who occasionally pickup some medication need less guidance than elderly feeble patients using multiple medication.

The forthcoming architecture for electronic prescriptions would be that patients could indicate their wish for a preferred pharmacy through a patient portal. In future, a prescriber would only register the prescription in his or her own system. The national system would know if a patient has a preferred pharmacy and redirect the prescription directly to this dispensing point. If no preferred pharmacy is registered, then the prescription will be held at the source until the patient appears at a pharmacy to ask the pharmacist to retrieve the prescription. This does however mean that the medication has to be prepared and that the patient has to wait.

Nictiz

Nictiz, a member of the European Association of Healthcare IT Managers, is the national coordination point and knowledge centre for IT and innovation in the healthcare sector in the Netherlands.

The national switch point forms the core of electronic communications in the sector, which is managed by Nictiz. Any authorized healthcare practitioner can be connected to the switch point so that he or she can obtain the latest and most relevant information about a patient at any time, from anywhere in the Netherlands and in a simple, secure and reliable way.

In consultation with, and at the request of the healthcare sector, Nictiz is continuously developing and refining national standards for electronic communications in healthcare. Furthermore, Nictiz supports the sector in developing functional IT solutions that can be used nationwide, and contributes to policy making on IT issues as they relate to healthcare on a national and international level.

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