Health Information and Quality Authority

An tÚdarás Um Fhaisnéis agus Cáilíocht Sláinte

Health Information and Standards

Draft Standard for consultation: Information requirements for community-based ePrescribing

July 2018

Safer Better Care

Version control

This section lists the previous and current versions of the document, summarising the major change in each version.

Date	Change
July 2018	Draft created

About the Health Information and Quality Authority

The Health Information and Quality Authority (HIQA) is an independent authority established to drive high-quality and safe care for people using our health and social care services in Ireland. HIQA's role is to develop standards, inspect and review health and social care services and support informed decisions on how services are delivered. HIQA's ultimate aim is to safeguard people using services and improve the safety and quality of health and social care services across its full range of functions.

HIQA's mandate to date extends across a specified range of public, private and voluntary sector services. Reporting to the Minister for Health and the Minister for Children and Youth Affairs, HIQA has statutory responsibility for:

- **Setting Standards for Health and Social Services** — Developing person-centred standards, based on evidence and best international practice, for health and social care services in Ireland.
- **Regulation** — Registering and inspecting designated centres.
- **Monitoring Children's Services** — Monitoring and inspecting children's social services.
- **Monitoring Healthcare Safety and Quality** — Monitoring the safety and quality of health services and investigating as necessary serious concerns about the health and welfare of people who use these services.
- **Health Technology Assessment** — Providing advice that enables the best outcome for people who use our health service and the best use of resources by evaluating the clinical effectiveness and cost-effectiveness of drugs, equipment, diagnostic techniques and health promotion and protection activities.
- **Health Information** — Advising on the efficient and secure collection and sharing of health information, setting standards, evaluating information resources and publishing information about the delivery and performance of Ireland's health and social care services.

Overview of the health information function of HIQA

Healthcare is information-intensive, generating huge volumes of data every day. Health and social care workers spend a significant amount of their time handling information, collecting it, looking for it and storing it. It is therefore imperative that information is managed in the most effective way possible in order to ensure a high-quality, safe service.

Safe, reliable healthcare depends on access to, and the use of, information that is accurate, valid, reliable, timely, relevant, legible and complete. For example, when giving a patient a drug, a nurse needs to be sure that they are administering the appropriate dose of the correct drug to the right patient and that the patient is not allergic to it. Similarly, lack of up-to-date information can lead to the unnecessary duplication of tests — if critical diagnostic results are missing or overlooked, tests have to be repeated unnecessarily and, at best, appropriate treatment is delayed or at worst not given.

In addition, health information has a key role to play in healthcare planning decisions — where to locate a new service, whether or not to introduce a new national screening programme and decisions on best value for money in health and social care provision.

Under section 8(1)(j), HIQA is charged with evaluating the quality of the information available on health and social care and making recommendations in relation to improving the quality and filling in gaps where information is needed but is not currently available.

Information and communications technology (ICT) has a critical role to play in ensuring that information to drive quality and safety in health and social care settings is available when and where it is required. For example, it can generate alerts in the event that a patient is prescribed medication to which they are allergic. Further to this, it can support a much faster, more reliable and safer referral system between the patient's GP and hospitals.

Although there are a number of examples of good practice, the current ICT infrastructure in Ireland's health and social care sector is highly fragmented with major gaps and silos of information which prevents the safe, effective, transfer of information. This results in people using the service being asked to provide the same information on multiple occasions.

In Ireland, information can be lost, documentation is poor, and there is over-reliance on memory. Equally, those responsible for planning our services experience great difficulty in bringing together information in order to make informed decisions. Variability in practice leads to variability in outcomes and cost of care. Furthermore, we are all being encouraged to take more responsibility for our own health and wellbeing, yet it can be very difficult to find consistent, understandable and trustworthy information on which to base our decisions.

As a result of these deficiencies, there is a clear and pressing need to develop a coherent and integrated approach to health information, based on standards and international best practice. A robust health information environment will allow all stakeholders, the general public, patients and service users, health professionals and policy makers to make choices or decisions based on the best available information. This is a fundamental requirement for a high reliability healthcare system.

Through its health information function, HIQA is addressing these issues and working to ensure that high quality health and social care information is available to support the delivery, planning and monitoring of services.

In 2013, HIQA completed an international review on ePrescribing[(1)] to inform the adoption of appropriate standards in Ireland. This review was revised in 2018[(2)] and is available on www.hiqa.ie. Both reviews focused on the prescribing and dispensing of medication in the community rather than in hospital settings. Countries examined in the international review initially focused on the electronic sharing of prescriptions in community settings and, following successful implementation, built upon this by implementing electronic prescribing in other settings such as within hospital outpatient departments, emergency departments and inpatient settings. Starting with community-based ePrescribing is explained as a consequence of both prescribers and pharmacists having similar processes to their peers and, hence, being able to support computerisation of the process. By contrast, hospital medication management processes are typically more complex, incorporate multiple processes, including medication reconciliation on admission, ward-based dispensing, recording administration of medication to patients and discharge planning, making standardisation and computerisation more complicated.

HIQA are now defining information requirements for community-based electronic prescribing and dispensing that will inform technical specifications which HIQA will develop. Information requirements are a minimum set of data items that are recommended for implementation in information systems that create and transfer information to support the delivery of safe and quality care to patients. The inclusion of data items in the minimum set of data is determined by the clinical relevancy of the data item and the potential for the data item to improve patient safety in a collaborative care environment. The draft information requirements presented in this document have been developed in conjunction with our eHealth Standards Advisory Group and are based on international evidence and ongoing initiatives that are being undertaken globally.

Contents

Chapter 1 Introduction

Electronic prescribing can deliver significant benefits for patients, prescribers, pharmacists and others involved in the process.[3] In particular, ePrescribing can improve patient safety, for example, by reducing errors of mistaken identity, incorrect dosage, incorrect medication and adverse drug interactions. It can also reduce the number of pharmacist's interventions significantly. Moreover, ePrescribing costs less and takes less time than processing the same prescriptions manually.

The vision for the Irish national, community-based ePrescribing programme is set out in the eHealth Strategy for Ireland[4]. The goal of ePrescribing identified in the eHealth Strategy is to reduce medication errors, thereby reducing the associated costs, and speeding up patient access to medication. eHealth Ireland is responsible for realising this vision and, in June 2015, announced the National ePharmacy Programme, which includes ePrescribing in primary care among its initiatives.

Today in Ireland, doctors, dentists and nurse prescribers create paper-based prescriptions which are signed and given to the patient or their representative. However, many countries create an electronic version of the paper prescription and make it available to pharmacists when the patient presents at the pharmacy, this is known as electronic prescribing or ePrescribing.

ePrescribing can be described as a three-step approach. First, at the time of prescribing medications for a patient, the prescriber's clinical information system also generates the prescription in electronic format. Second, the electronic format of the prescription is transmitted to a message exchange or mailbox and, when the patient presents in a pharmacy requesting their medication, the pharmacist retrieves the electronic prescription from the message exchange. Third, the pharmacists dispenses the medication and reports on the medicines given to the patient.

HIQA has given significant attention to ePrescribing due to the benefits that it potentially offers.. In 2012, HIQA completed an international review on ePrescribing[1] to inform the adoption of appropriate standards in Ireland. The international review was revised in 2018, and revised review outlined changes to ePrescribing initiatives internationally since 2012.[2] HIQA has previously developed the following standards which are related to electronic prescribing:

- *ePrescription dataset and clinical document architecture standard* (March 2015)[5]
- *Data model for an electronic medicinal product reference catalogue – a National Standard* (March 2015)[6]
- *National Standard for a Dispensing Note including a Clinical Document Architecture specification* (January 2017).[7]

HIQA is now developing standards to define the information requirements required to implement community-based ePrescribing and dispensing in Ireland. Information requirements are minimum set of data items that are recommended for implementation in information systems that create and transfer information to support the delivery of safe and quality care to patients. The inclusion of data in the minimum set of data is determined by the clinical relevancy of the data and the potential for the data to improve patient safety in a collaborative care environment. Those exchanging the information are primary care healthcare providers such as GPs or nurse prescribers, for prescribing, and community pharmacists, for dispensing of medication.

Methodology

This standard is being developed under section 8(1)(k) of the Health Act 2007 and subsequent amendments which allows HIQA set standards for the Health Service Executive and service providers. This draft standard for consultation is based on the international evidence and ongoing interest and initiatives that are being undertaken globally. It has been developed in collaboration with the eHealth Standards Advisory Group, which is listed in Appendix A. In addition, a working group was convened with prescribers and pharmacists to inform the information requirements prior to undertaking the public consultation.

Reflecting HIQA's commitment to consultation and engagement, each project includes a public consultation to solicit and incorporate feedback from external stakeholders. The public consultation ensures that the final information requirements have taken account of existing processes nationally and internationally and includes any appropriate requirements identified by stakeholders.

The *Draft Standard for Consultation: Information requirements for community-based ePrescribing* will be made available for public consultation on Thursday 19th July 2018. The consultation will run for six weeks, closing on Friday 31st August 2018. Appendix B documents the consultation questions and provides information on how to make submissions to the consultation.

Once the public consultation is complete, the information requirements for community-based ePrescribing will be updated with all accepted changes and then circulated to the Advisory Group for final review at a meeting in September 2018.

Based on the final version of the information requirements, HIQA will develop technical specifications to support the implementation of the information requirements.

Information requirements provide the basis for producing technical or messaging specifications which detail how to transform the data items into electronic messages sent between prescribers and pharmacists. Examples of international healthcare messaging standards include Health Level Seven International (HL7) version 2.4v Messaging Standard and HL7 Fast Healthcare Interoperability Resources (FHIR) standard.

Appendix C provides a mapping of the draft information requirement presented in Chapter 3 to both the 2.4v Messaging Standard and the FHIR standard.

Appendix D provides and extract from the v2.4 Messaging Standard and illustrates the structure of the messages used to carry prescribing and dispensing information. Appendix E provides an extract from the FHIR standard and illustrates the structure to be used when sharing prescription and dispensing information between prescribers and pharmacists. Finally, Appendix F documents the high-level message flows which are required to support the use cases in Chapter 2.

The final information requirements and technical specifications for community-based ePrescribing will then be approved by HIQA before being submitted to the Minister for Health and published on the HIQA website.

Chapter 2 Background

Before defining the high-level information requirements for ePrescribing in Ireland, it is important to understand what the term 'ePrescribing' means, the benefits that a national ePrescribing programme can realize and the initiatives that are underway in Ireland and internationally.

2.1 Definition

The US Centers for Medicare and Medicaid Services state that 'ePrescribing is a prescriber's ability to electronically send an accurate, error-free and understandable prescription directly to a pharmacy from the point-of-care, an important element in improving the quality of patient care.'[8] This definition captures the generation of the prescription, the transmission of the prescription from prescriber to pharmacy and the pharmacy's dispensing of the prescription.

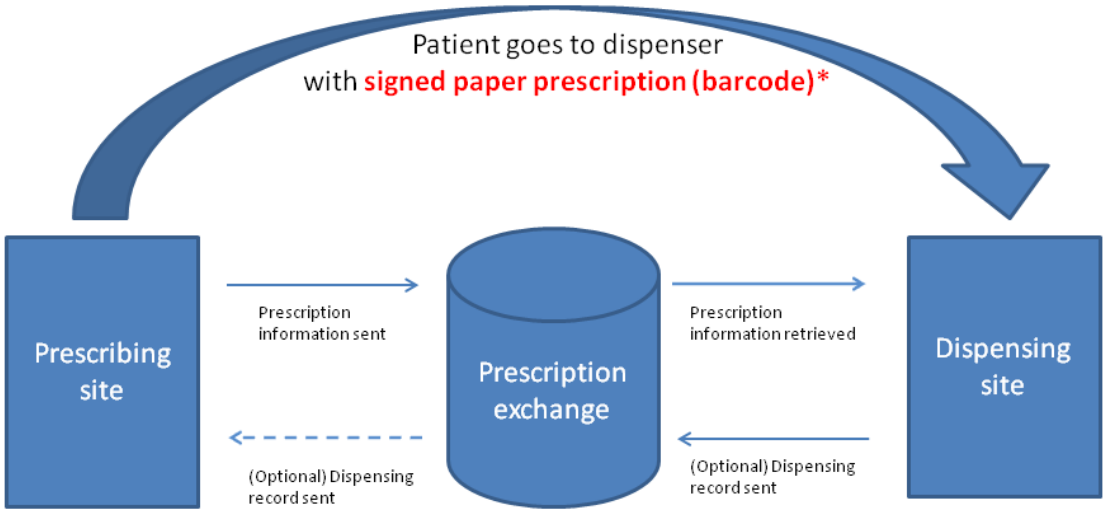
In a similar manner, the original Fifth Community Agreement between the Australian Department of Health and the Pharmacy Guild of Australia includes the following concepts: the prescriber's ability to generate an accurate prescription electronically, the electronic transfer of the prescription to the pharmacist and the pharmacist's ability to receive and dispense the prescription. It also states explicitly that the prescription must be signed digitally, transmitted securely and integrate with the pharmacy billing system.[9]

The European Patient Smart Open Services (epSOS) initiative, which sought to develop an eHealth infrastructure that would enable seamless and secure access to patient health information across borders for European citizens, defined the ePrescribing process as having two parts:

- **ePrescribing** is defined as a prescriber's ability to electronically send an accurate, error-free and understandable prescription directly to a pharmacy from the point of care.[10,11]
- **eDispensing** is defined as the act of electronically retrieving a prescription and reporting on giving the medicine to the patient as indicated in the corresponding ePrescription.[11]

These international programmes reflect the general understanding that the term ePrescribing is used to describe all aspects of the generation and transfer of prescriptions electronically using a dedicated system, whether in paper or electronic from, rather than faxing or emailing the prescription.[3] The same sources consistently identify ePrescribing as taking place in primary care, which involves the generation of the prescription by GPs, the transmission of prescriptions electronically from GP to pharmacy over national networks and the pharmacy dispensing the prescription.

Figure 1. ePrescribing with paper prescription



In this scenario, ePrescribing mimics the paper-script-based business practice and the paper prescription remains the legal document, indicated in red with an asterisk (*):

1. **ePrescribing:** The prescriber generates a paper prescription with a barcode, which the prescriber signs. The barcode can contain either a unique identifier or all the prescription information.
2. **Electronic transfer of the prescription:** An electronic version of the prescription is sent to the prescription exchange, where it is stored until it is downloaded and dispensed.
3. **eDispensing:** The pharmacist scans the barcode on the paper prescription, which contains either all of the prescription information or a unique identifier to retrieve the prescription information.

The pharmacist can optionally send an acknowledgement that the prescription items have been dispensed.

International programmes usually take a phased approach to implementation. A two-phased approach was adopted in England. During the first phase, a signed, barcoded paper prescription continues to be the legal document, with prescription information transferred electronically in parallel. This approach allows time for stakeholders to build skills and experience the benefits of ePrescribing as well as for the requisite legislative changes to be introduced. This provides a solid foundation for the second phase, when the digitally signed, electronic prescription is the legal document.

A two-phased approach was also adopted in Australia, with two similar levels of implementation levels supported — first, with the paper prescription as the legal document, and second, with the electronic prescription as the legal and definitive document. Both levels assumed that prescription information was transferred electronically through a message exchange. However, the Australian implementation approach supported direct transfer from GP practice to pharmacy as an interim measure. These implementations, and ten others, are described in HIQA's 2018 international review, *ePrescribing: An International Review*. The review also found that successful national ePrescribing programmes began with a community-based ePrescribing service and gathered clear and detailed information requirements.

2.2 Benefits

The evidence shows that ePrescribing benefits can include time savings and efficiency gains, transparency and fraud detection, health and social benefits and cost benefits.

A national ePrescribing service can benefit prescribers by enabling the safe electronic sharing of prescription information. This reduces the administration effort required by GP practices with existing paper-based prescriptions. This can potentially increase the amount of time GPs can spend on consultations with patients and reduce reliance on less reliable, traditional means of information sharing such as transcribing of prescription information. Prescribers can receive notifications when a patient collects a prescription from pharmacy, enabling the prescriber to ensure follow-up with the patient. There may also be reduced

interruptions from pharmacies who have queries about prescriptions or need corrections to a prescription.

A national ePrescribing service can benefit pharmacists through the electronic downloading of prescription details, rather than manual entry. This can make the dispensing process more efficient and can reduce error (thus increasing patient safety). It can also reduce the time the pharmacist spends contacting prescribers to query, clarify or get a correction for a prescription, which improves the quality of prescriptions.

Most important, ePrescribing can improve patient outcomes significantly. Approximately half of the 17% of patient hospitalisations that are due to medication error are considered avoidable.[12] ePrescribing can reduce medication errors. For example, it has reduced medication errors by an estimated 15% in Sweden.[12] It can also make both prescribers and pharmacists more accountable through increased transparency.[12] ePrescribing can make time-critical medications more readily available to patients, and it costs far less and takes less time than processing the same prescriptions manually, saving time and money.[3] In Estonia, the cost savings from ePrescribing in 2010 almost matched the country's investment in the printing and secure storage of the forms in 2009.[12]

2.3 ePrescribing in Ireland

The vision for the Irish national, community-based ePrescribing programmes is set out in the Department of Health's eHealth strategy. The goal of ePrescribing strategy in Ireland is to reduce medication errors, thereby reducing the associated costs, and speeding up patient access to medication.[13] eHealth Ireland is responsible for realizing this vision and, in June 2015, announced the National ePrescribing Programme, which included ePrescribing in primary care and the National Medicinal Product Catalogue among its projects.

The national, community-based ePrescribing programme also published its plan for a phased, standards-based implementation. The programme's phased approach included the development of the initial building blocks (phase 1), leading to an 'ePrescription' phase (phase 2), followed by the roll out of ePrescribing in primary care (phase 3). The adoption of a phased, pilot-based approach is in line with recommendations and best practices.

As part of phase 1, eHealth Ireland worked with a number of organisations to develop a relevant interoperability framework based on national and international standards. HIQA, whose statutory remit includes developing national technical standards for health information, has defined and agreed the related standards for messaging and datasets, including:

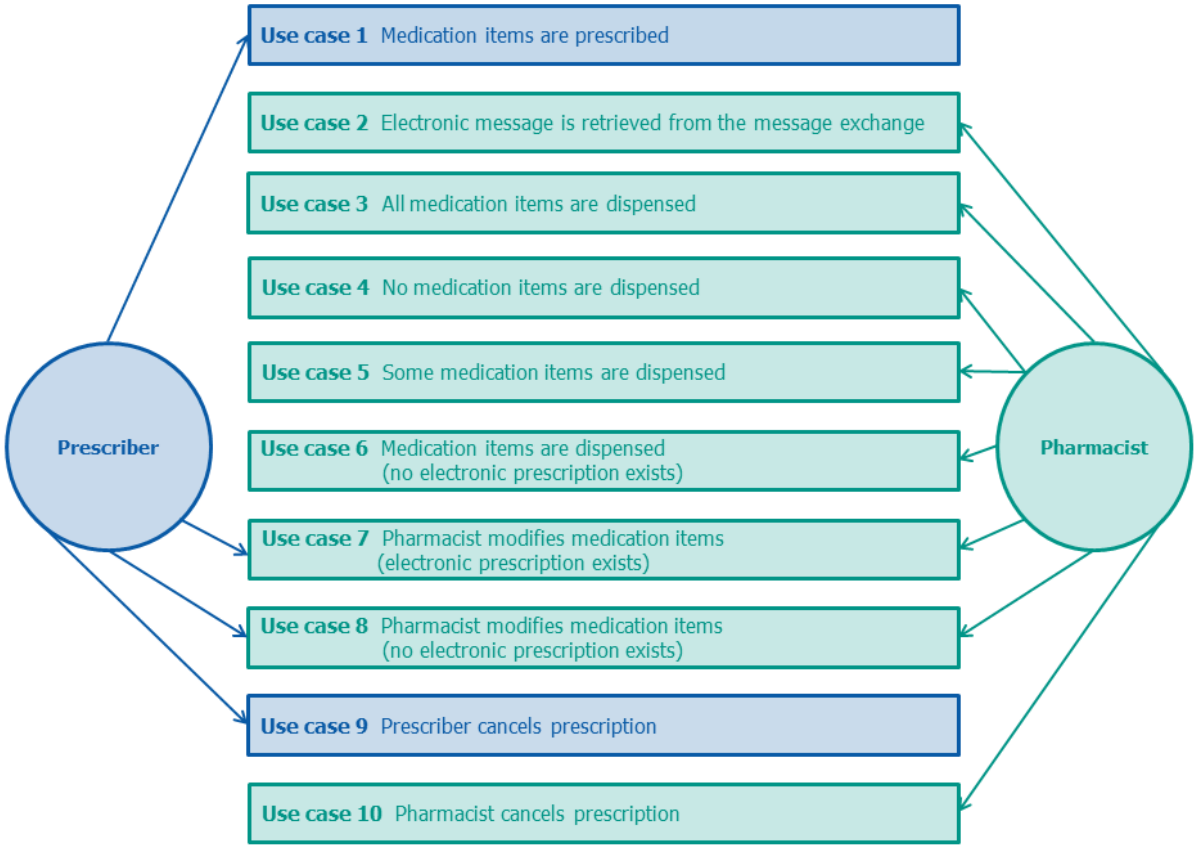
- *ePrescription dataset and clinical document architecture standard* (March 2015)[5]
- *Data model for an electronic medicinal product reference catalogue – a National Standard* (March 2015)[6]
- *National Standard for a Dispensing Note including a Clinical Document Architecture specification* (January 2017).[7]

Two ePrescribing pilot projects have also been undertaken to date. The first pilot transferred electronic prescription information directly from prescribers to pharmacies. One of the lessons learned from the pilot was that, in order to ensure patient choice, it was better for the electronic prescription information to be sent to a message exchange or mailbox rather than directly to a pharmacy. In the second pilot project, prescribers sent the prescription information to the cloud and generated the legal paper script that included a barcode. When patients presented to pharmacies requesting their medication, the pharmacist scanned the barcode on the prescription and the prescription information was downloaded in electronic format for the pharmacist to review.

Chapter 3 Use cases

Use cases are a tool used to describe how actors interact with an information system. In the context of ePrescribing, they describe how patients, prescribers and pharmacists interact with a national community-based electronic prescribing system. Figure 2 illustrates the ten use cases required to support ePrescribing in the community. These use cases have been developed in conjunction with our eHealth Standards Advisory Group. A brief description of each use case is provided along with clinical examples.

Figure 2. Use cases for ePrescribing



3.1 An electronic prescription exists, all, some or no medication is dispensed

At the time of prescribing medication to a patient, a prescriber clinical information system creates a barcoded paper prescription that the prescriber signs and an electronic version of prescription that is sent to and stored at a message exchange or mailbox. The patient subsequently attends a pharmacist and provides the pharmacist with the barcoded paper prescription, which allows the pharmacist to identify and retrieve the electronic prescription from the message exchange. The pharmacist then dispenses some or all of the prescribed medication in accordance with the prescription information. An electronic record of the medications dispensed by the pharmacists is sent to the message exchange. Finally, if no medications are dispensed for the prescription, the pharmacist indicates this by returning the unfulfilled items in a message back to the message exchange.

3.1.1 Clinical examples to describe use cases 1, 2, 3, 4 and 5

- The patient attends a prescriber and is prescribed medication. (Use case 1)
- A patient may contact a prescriber requesting that a repeat prescription is issued. (Use case 1)
- A next of kin or carer may request a prescription be issued for a patient. (Use case 1)
- The patient or a person on their behalf attends the pharmacy of his/her choice in order to have medication items dispensed. The pharmacist retrieves the electronic prescription from the message exchange. (Use case 2)
- A prescription is presented to a pharmacist. The person the prescription relates to may present in person or another person may collect the prescription on their behalf. The pharmacist retrieves the electronic prescription from the message exchange. The pharmacist is able to dispense all medication items on the prescription (Use case 2 and Use case 3).
- The patient receives a prescription from a prescriber and decides to have the price checked at the pharmacy without any of the prescribed medication items being dispensed. (Use case 2 and Use case 4)

- The patient attends the pharmacy of his/her choice but the pharmacy does not have the required medication in stock and no medication items are dispensed (Use case 2 and Use case 4)

- The patient attends a prescriber and receives a prescription for one or more medication items. The pharmacist does not have all medications in stock but dispenses some of the medication items prescribed (Use case 2 and Use case 5)
- The patient attends the GP and receives a prescription for more than one medication. The patient decides to collect only part of the prescription; therefore, some of the medication items are dispensed (Use case2 and Use case5)
- A General Medical Services (GMS) patient attends the GP and receives a prescription for more than one medication item. Some medications are not covered under the GMS scheme and are, therefore, not dispensed (Use case2 and Use case5)

3.2 No electronic prescription exists, all medication is dispensed

A patient attends a pharmacist with a paper prescription and no electronic prescription exists for the prescription from the prescriber. The pharmacist dispenses the medication items to the patient and records this on their computer system. An electronic record of the medications dispensed by the pharmacists is sent to the message exchange.

3.2.1 Clinical examples to describe use case 6

The prescriber has given the patient a handwritten, typed, or printed prescription because:

- A patient attends a prescriber who has yet to computerise processes and is given a handwritten, typed or printed prescription.
- Information systems are not functioning and the prescriber must revert to manual processes and prescribe using a paper handwritten prescription.
- A patient is reviewed by a prescriber during a home visit and the prescriber writes a paper prescription.
- A patient is reviewed by a prescriber out of hours and the prescriber creates a paper prescription.

3.3 An electronic prescription exists, modified medication is dispensed

At the time of prescribing medication to a patient a prescriber's clinical information system creates a barcoded paper prescription which the prescriber signs and an electronic version

of prescription is sent to and stored at a message exchange or mailbox. The patient visits a pharmacist to have the medication items dispensed. Prior to dispensing a medication item, the pharmacist decides a substitution is to be made for one of the medication items. This requires authorisation by the prescriber. The authorisation to change the medication items is obtained and a prescriber subsequently issues an updated prescription. An electronic record of the medications dispensed by the pharmacists is sent to the message exchange.

3.3.1 Clinical examples to describe use case 7

- The pharmacist feels it is necessary to change the dose of a medication due to an error on the prescription or other clinical factors.
- The duration that the medication is to be taken may require a change.
- The route of administration of the medication may need to be changed.
- The pharmacist may have knowledge of an allergy that requires substitution for a different type of medication.

3.4 No electronic prescription exists, modified medications are dispensed

A patient attends a doctor and is prescribed medication items on a paper prescription. The patient visits a pharmacy to have the medication items dispensed. Prior to dispensing medication, a substitution is made for one of the medication items which requires authorisation by the doctor. The authorisation is obtained and a doctor sends another paper prescription to the pharmacy. An electronic record of the medications dispensed by the pharmacists is sent to the message exchange.

3.4.1 Clinical examples to describe the use case 8

- The pharmacist feels it is necessary to change the dose of a medication due to an error on the prescription or other clinical factors.
- The duration that the medication is to be taken may require a change.
- The route of administration of the medication may need to be changed.
- The pharmacist may have knowledge of an allergy that requires substitution for a different type of medication.

3.5 An electronic prescription exists which is subsequently cancelled

At the time of prescribing medication to a patient, a prescriber's clinical information system creates a barcoded paper prescription, which the prescriber signs, and an electronic version of prescription is sent to and stored at a message exchange or mailbox. After the patient has left, the prescriber decides the prescription should be cancelled.

The patient subsequently attends a pharmacist and provides the pharmacist with a barcoded paper prescription which allows the pharmacist to identify and retrieve the prescription from the message exchange. The pharmacist retrieves a cancelled prescription indicating that the prescriber has decided that the prescription is not required. The pharmacist informs the patient of the cancellation.

Alternatively, a patient attends a prescriber, who generates an electronic prescription which is sent and stored in the message exchange. The patient subsequently attends a pharmacist and provides the pharmacist with a barcoded paper prescription which allows the pharmacist to identify and retrieve the prescription from the message exchange. The pharmacist decides that the prescription should be cancelled. Authorisation is received from the prescriber, and the pharmacist cancels the prescription and informs the patient.

3.5.1 Clinical examples to describe the use case 9 and use case 10

- The prescriber or pharmacist suspects medication misuse or abuse. (Use case9 and use case10)
- The pharmacist discovers the prescriber is not authorised to prescribe a certain type of medication. (Use case 10)
- The pharmacist may decide it is unsafe to dispense the medication prescribed. (Use case 10)
- The pharmacist may discover that the prescription is for an unlicensed medication and may cancel the prescription. (Use case 10)

Chapter 4 Information requirements

This section describes the information requirements needed to support community-based ePrescribing. As stated earlier previously, information requirements define the minimum set of data items that are recommended for implementation in information system that create and transfer information to support the delivery of quality collaborative care. The inclusion of data in the minimum set of data is determined by the clinical relevancy of the data and the potential for the data to improve patient safety in a collaborative care environment.

This section defines the information that should be contained within an ePrescription message when an electronic prescription is generated by a clinical information system used by a prescriber. It also defines the information that should be contained within an electronic dispensing record generated at the time of dispensing the medication to the patient in a community pharmacy. Though additional information regarding the patient's visit may be recorded by the prescriber or pharmacist, HIQA has only identified the information that is required to be shared in an electronic solution in order to ensure safe prescribing and dispensing practices.

Sources which have been used in the development of the information requirements to date include:

- epSOS Semantic Implementation Guidelines Work Package 3.9 – Appendix B1/B[14]
- Integrating the Healthcare Enterprise, Pharmacy, Community Medication Prescription and Dispense's Technical Framework, Trial Implementation (2015)[15]
- Digital Health Australian's National Requirements for electronic prescriptions version 1.0[16]
- Health Level Seven International Messaging Standards — version 2.4, version 2.6 and version2.7[17]
- Health Level Seven International HL7 Fast Healthcare Interoperability Resources standard (FHIR)[18]
- openEHR Clinical Knowledge Manager Medication Order Archetype[19]
- Electronic Pharmaceutical Messaging Standards, New Zealand[20]
- the US National Council for Prescription Drug Programs[21]
- HL7 Implementation Guide: CDA R2 Continuity of Care Document (CCD).[22]

The information requirement tables presented below describe each data items in term of a requirement statement and an usage statement. The definitions of SHALL and SHOULD are as follows:

SHALL	When appearing in a requirement, the verb **SHALL** indicates a mandatory requirement. Its negative form **SHALL NOT** indicates a prohibition.
SHOULD	When appearing in a requirement, the verb **SHOULD** indicates a recommendation. Its negative form **SHOULD NOT** indicates an option that is not recommended.

4.1 Subject of care information requirement

Table 1 describes the information requirements for the patient's demographic details. Though additional information may be recorded at the time of the visit, HIQA has only identified the information that is required to be shared in an electronic solution in order to ensure safe prescribing and dispensing practices.

Table 1. The patient's demographic details

No.	Data item	Requirement statement	Usage
1.1	**Title**	The patient summary **SHOULD** contains the title relevant to the subject of care.	A coded value to be selected from a predefined list.
1.2	**Forename**	The patient summary **SHALL** contain a patient's first name or given name(s) as per their birth certificate.	A patient's first name or given name(s) as per their birth certificate.
1.3	**Surname**	The patient summary **SHALL** contain the second part of a patient's name which denotes their family or marital name.	The second part of a patient's name which denotes their family or marital name.
1.4	**Address**	The patient summary **SHALL** contain the location to be used to contact or correspond with the patient. This would normally be the patient's usual home address.	The particulars of the place where the patient lives.
1.5	**Date of birth**	The patient summary **SHALL** contain the date of birth indicating the day, month and year when the patient was	The date of birth should be supplied in dd/mm/yyyy format.

		born.	
1.6	**Sex**	The patient summary **SHALL** contain gender identity is a person's sense of identification with either the male or female sex, as manifested in appearance, behaviour and other aspects of a person's life.	Gender identity is a person's sense of identification with either the male or female sex, as manifested in appearance, behaviour and other aspects of a person's life.
1.7	**Health identifier**	The patient summary **SHOULD** contain a number or code assigned to an individual to uniquely identify the individual within an organisation.	Both the code and the code type the code relates to should be provided, for example, 0987654321 Individual Healthcare Identifier (IHI). Other identifiers which may be carried in this field include the General Medical Services Scheme, Drug Payment Scheme, Long Term Illness Scheme and Hardship Scheme identifiers.

4.2 Prescribing information requirements

Table 2 describes the information requirements for medication prescribed for a patient. Though additional information may be recorded at the time of the visit, HIQA has only identified the information that is required to be shared in an electronic solution in order to ensure safe prescribing and dispensing practices.

Table 2. Prescribing information requirements

No.	Data item	Requirement statement	Usage.
2.1	**Date written**	The prescription **SHALL** state the date on which the prescription was written.	The date field which indicates when the prescription was written.
2.2	**Medicinal product**	The prescription **SHALL** state the name of the medicinal product or package. It may be	The medicinal products that are prescribed. This field also covers where package level

		a trade name or a generic name.	dispensing occurs or where a formulation takes place in the pharmacy in order to produce the substance dispensed to the patient.
2.3	**Dose form (strength)**	The prescription **SHOULD** state the content of the active ingredient expressed quantitatively per dosage unit, per unit of volume or per unit of weight, according to the pharmaceutical dose form.	This field consists of a size value and unit, with a combination of both defining the strength, for example, 250mg, 1g.
2.4	**Dose form (type)**	The prescription **SHOULD** include a description of the dose type.	This field describes the dose type, for example, tablet or vial.
2.5	**Dose form (total)**	The prescription **SHOULD** include the total number of instances of the medicinal product required to fulfil the prescription.	This field is used to describe the number of the unit(s) to dispense.
2.6	**Dose form (intake)**	The prescription **SHOULD** state the number of the instances of the medicinal product to be taken by the patient at a given time.	This field is used to describe the number of unit(s) to be taken at a given time.
2.7	**Frequency**	The prescription **SHOULD** state how often the medication is to be administered, often expressed in number of times per day but may also include information such as one hour before or after meals.	This field is used to describe the frequency of the does that should be taken by the patient.
2.8	**Duration**	The prescription **SHOULD** state the duration of the regime to be taken.	This field is used to describe the duration of the dose to be taken by the patient.
2.9	**Route of administration**	The prescription **SHOULD** indicate how the medication is to be received by the patient.	A representation of the place in or on the body when the medicinal product or active ingredient is introduced in order to achieve the desired effect.
2.10	**Advice to pharmacist**	The prescription **SHOULD** include any advice the prescriber might suggest to the pharmacist.	Additional advice the prescriber may provide to the pharmacist.
2.11	**Substitution**	The prescription **SHOULD** be used to indicate if the	Indicates whether the prescriber does not want

	medication prescribed may not be substituted.	generic substitution to occur.
2.12 Indications	The prescription **SHOULD** provide clinical information about the reason for providing the medication.	The clinical reasons why the medicinal product is being prescribed.
2.13 Repeats	The prescription **SHOULD** provide an indication that a prescription item can dispensed repeat or not.	This indicate whether the prescriber wishes for the prescription to be repeated.
2.14 Number of repeats	The prescription **SHOULD** provide an indication of the number of occasions the prescription may be repeated	The number of times that the prescription may be dispensed.
2.15 Advice to patient	The prescription **SHOULD** any advice the prescriber might suggest to the patient.	Additional advice the prescriber may provide to the patient.

4.3 Dispensing information requirements

Table 2 describes the information requirements for medications dispensed to a patient. Though additional information may be recorded at the time of the visit, HIQA has only identified the information that is required to be shared in an electronic solution in order to ensure safe prescribing and dispensing practices.

Table 3. Dispensing information requirements

No.	Data item	Requirement statement (Usage)	Usage
3.1	**Date time of dispense event**	The dispensing record **SHALL** include the point in time at which the medication action is completed.	The date field which indicates when the prescription was dispensed.
3.2	**Medicinal product**	The dispensing record **SHALL** state the medicine, vaccine or other therapeutic good that was dispensed.	The medicinal products that were dispensed. This field also covers where package level dispensing occurs or where a formulation takes place in the pharmacy in order to produce the substance dispensed to the patient.
3.3	**Dose form (strength)**	The dispensing record **SHOULD** state the strength of the, vaccine, or other therapeutic good that was dispensed.	This field consists of a size value and unit, with a combination of both defining the strength, for example, 250mg, 1g.
3.4	**Dose form (type)**	The dispensing record **SHOULD** state the formulation or presentation of the overall substance.	This field describes the dose type, for example, tablet, vial.
3.5	**Dose form (total)**	The dispensing record **SHOULD** the total quantity of medicine, vaccine, or other therapeutic good that was dispensed.	This field is used to describe the number of the unit(s) dispensed.
3.6	**Dose form (intake)**	The dispensing record **SHOULD** state the number of the instances of the medicinal product to be taken by the patient at a given time.	This field is used to describe the number of unit(s) to be taken at a given time.
3.7	**Frequency**	The dispensing record **SHOULD** state how often	This field is used to describe the frequency of the dose that

		the medication is to be administered, often expressed in number of times per day but may also include information such as one hour before or after meals.	should be taken by the patient.
3.8	**Route of administration**	The dispensing record **SHOULD** indicate how the medication is to be received by the patient.	A representation of the place in or on the body when the medicinal product or active ingredient is introduced in order to achieve the desired effect.
3.9	**Label instructions**	The dispensing record **SHOULD** include any instructions given to the subject of care or carer at the time of the dispense event.	The label instructions provided to the patient at the time of dispensing the medication.
3.10	**Brand substitution occurred**	The dispensing record **SHOULD** state a different brand of the same medicine, vaccine or other therapeutic good was substituted for the one nominated in the order.	This field indication whether brand substitution occurred
3.11	**Number of this dispense**	The dispensing record **SHOULD** include a numeric value that represents the dispense number or sequence number that has been reached for a therapeutic good prescribed with repeats.	The number of times that the prescription has been dispensed.
3.12	**Maximum Number of Repeats**	The dispensing record **SHOULD** state the number of times the support of the prescribed item may be repeated under the terms of the prescription.	The maximum number of times that the prescription may be dispensed.
3.13	**Manufacturer**	The dispensing record **SHOULD** include the administrative code of the manufacturer of the pharmaceutical item supplied.	This field hold information related to the manufacturer of the medicinal product dispensed.

Chapter 5 Conclusion

International evidence showed that successful ePrescribing programmes have both a very clear scope and a detailed business case that outlined both expected benefits and costs. Effective programmes sought and reached clear agreement on common standards that should be adopted and on the implementation approach. A coordinated, standards-based phased rollout was also considered crucial to the success of a national, community-based ePrescribing programme.

Internationally programmes typically implemented their national, community-based ePrescribing programmes first. The community-based implementation facilitated the piloting of standards, such as messaging standard and robust authentication services. Effective piloting was also identified as crucial. Lessons learned from community-based ePrescribing programmes were used to inform the later, more complex implementation of medication management in secondary settings.

A National Standard for ePrescribing can standardise how a patient's healthcare information is recorded and shared in an electronic solution in order to ensure safe prescribing and dispensing practices.

Next steps

The Draft Standard for Consultation: Information requirements for community-based ePrescribing will be made available for public consultation on Thursday 19th July 2018. The public consultation will run for six weeks, closing on Friday 31st August 2018. Appendix B documents the consultation questions and provides information on how to make submissions to the consultation.

Once the public consultation is complete, the information requirements for community-based ePrescribing will be updated with all accepted changes and then circulated to the Advisory Group for final review.

Based on the final version of the information requirements, HIQA will develop technical specifications to support the implementation of the information requirements.

Subsequently, the information requirements and supporting technical document for ePrescribing will then be approved by HIQA before being submitted to the Minister for Health and being published on the HIQA website.

Appendix A Advisory group

The following groups and organisations participate the eHealth Standards Advisory Group (eSAG)[1]:

- Department of Health
- Council of Clinical Information Officers (HSE)
- Knowledge Management/Health Intelligence (HSE)
- National Standards Authority of Ireland
- General Practice Information Technology Group
- Office of the Chief Information Officer (HSE)
- Irish Pharmacy Union
- Royal College of Surgeons of Ireland
- Royal College of Physicians
- Faculty of Nursing & Midwifery (RCSI)
- Enterprise Ireland.

[1] HIQA is in the process of revising the membership of the eSAG and future membership will include patient representation.

Appendix B Consultation questions

A key issue for Ireland is to determine the high-level information requirements for a National Standard for community-based ePrescribing in Ireland. The *Draft Standard for Consultation: Information requirements for community-based ePrescribing* is available for public consultation for a six-week period. In this way, the public, service users and service providers will have the opportunity to provide feedback and participate in the development process. We invite all interested parties to submit their views on this document.

Question 1:

Have you any alterations you would make to the subject of care information requirements?

Question 2:

Have you any additional items to add to the subject of care information requirements?

Question 3:

Have you any alterations you would make to the prescription information requirements?

Question 4:

Have you any additional items to add to the prescription information requirements?

Question 5:

Have you any alterations you would make to the dispensing information requirements?

Question 6:

Have you any additional items to add to the dispensing information requirements?

Question 7:

Have you any general comments you would like to make about this document?

How to submit feedback

There are several ways to tell us what you think.

Your comments can be submitted by downloading and completing the consultation feedback form available from www.hiqa.ie and e-mailing your completed forms to ePrescribingstandard@hiqa.ie.

You can print off a copy of the feedback form from our website and post it to us at:

Health Information and Quality Authority
Draft Standards for Consultation (ePrescribing)
George's Court
George's Lane
Smithfield
Dublin 7.

For further information or if you have any questions, you can talk to the consultation team by calling (01) 8147683. The closing date for receipt of comments is 5pm on Friday 31st August 2018.

How we will use your comments

Following the consultation, all submissions will be considered and used as appropriate to inform the work of HIQA and of the Advisory Group in the development of a National Standard for ePrescribing in Ireland. We would like to thank you for taking the time to submit your comments.

Appendix C Mapping to messaging standards

Table 4 maps each of the field in the prescribing information requirements to two Health Level 7 International messaging standards – the Version 2.4 standard and the Fast Healthcare Interoperability Resources standard.

Table 4. Prescribing information requirements mapping

Data Item	HL7 v2.4	FHIR
Date written	ORC-9 Date/time of transaction	MedicationRequest.authoredOn
Medicinal product	RXO-1	MedicationRequest.medication
Dose form (strength)	RXO-2 Requested give amount - minimum RXO-4 Requested give units	MedicationRequest.Medication.ingredient.amount
Dose form (type)	RXO-5 - Requested dosage form	MedicationRequest.Medication.ingredient.form
Dose form (total)	RXO-11 Requested dispense amount	MedicationRequest.dispenseRequest.quantity
Dose form (intake)	ORC-7 Quantity/Timing	MedicationRequest.dosageInstruction.dose
Frequency	ORC-7 Quantity/Timing	MedicationRequest.dosageInstruction.timing
Duration	ORC-7 Quantity/Timing	MedicationRequest.dosageInstruction.timing
Route of administration	RXR-1 Route	MedicationRequest.dosageInstruction.route
Advice to pharmacist	RXO-6 Provider's pharmacy/treatment instructions	MedicationRequest.supporting information
Substitution	RXO-9 Allow substitutions	MedicationRequest.substitution
Indications	RXO-20 Indication	MedicationRequest.reason
Repeats	RXO-13 Number of refills	MedicationRequest.DispenseRequest.numberOfRepeatsAllowed
Number of Repeats	RXO-13 Number of refills	MedicationRequest.DispenseRequest.numberOfRepeatsAllowed
Advice to patient	RXO-7 Provider's administration instructions	MedicationRequest.dosageInstruction.patientInstruction

Table 5 maps each of the field in the dispensing information requirements to two messaging two Health Level 7 International messaging standards – the Version 2.4 standards and the Fast Healthcare Interoperability Resources standard.

Table 5. Dispensing information requirements mapping

Data Item	HL7 v2.4 ORC/ RXD/RXR	HL7 v2.4 RXE	FHIR
Date time of dispense event	ORC-9 & RXD-3		MedicationDispense.whenPrepared
Medicinal product	RXD-2	RXE-2	MedicationDispense.medication
Dose form (strength)	RDX-4 & RXD-5	RXE-3 & RXE-5	MedicationRequest.medication .Medication.ingredient.amount
Dose form (type)	RXD-6	RXE-6	MedicationDispense.medication .Medication.ingredient.form
Dose form (total)	RXD-4	RXE-10	MedicationDispense.Quantity
Dose form (intake)	ORC-7		MedicationDispense.dosageInstruction.dose
Frequency	ORC-7	RXE-1	MedicationDispense.dosageInstruction.timing
Route of administration	RXR-1		MedicationDispense.dosageInstruction.route
Label instructions	RXD-15	RXE-7	MedicationDispense.dosageInstruction.patientInstructions
Brand Substitution Occurred	RXD-11	RXE-9	MedicationDispense.substitution.wasSubstituted
Number of this Dispense	RXD-1	(RXE-16 & RXE-17)	
Maximum Number of Repeats	RXD-8	RXE-12	MedicationDispense.authorizingPerscription.
Manufacturer code	RXD20		MedicationDispense.Medication.manufacturer

Appendix D Hl7 v2.4 abstract message types

Table 6 is an extract from the HL7 v2.4 standards. It illustrates the full Health Level 7 International version 2.4 abstract message type used to carry prescription information. For further information, please see www.hl7.org.

Table 6. HL7 v2.4 OMP^O09 abstract message type

OMP^O09^OMP_O09	Pharmacy/treatment Order Message	Status	Chapter
MSH	Message Header		2
[{ SFT }]	Software		2
[UAC]	User Authentication Credential		2
[{ NTE }]	Notes and Comments (for Header)		2
[	--- PATIENT begin		
PID	Patient Identification		3
[PD1]	Additional Demographics		3
[{ NTE }]	Notes and Comments (for Patient ID)		2
[	--- PATIENT_VISIT begin		
PV1	Patient Visit		3
[PV2]	Patient Visit - Additional Info		3
]	--- PATIENT_VISIT end		
[{	--- INSURANCE begin		
IN1	Insurance		6
[IN2]	Insurance Additional Information		6
[IN3]	Insurance Additional Information, Certification		6
}]	--- INSURANCE end		
[GT1]	Guarantor		6
[{ AL1 }]	Allergy Information		3
]	--- PATIENT end		
{	--- ORDER begin		
ORC	Common Order		4
[{	--- TIMING begin		
TQ1	Timing/Quantity		4
[{ TQ2 }]	Timing/Quantity Order Sequence		4
}]	--- TIMING end		
RXO	Pharmacy/Treatment Order		4
[{ NTE }]	Notes and Comments (for RXO)		2
{ RXR }	Pharmacy/Treatment Route		4
[{	--- COMPONENT begin		
RXC	Pharmacy/Treatment Component		4
[{ NTE }]	Notes and Comments (for each RXC)		2
}]	--- COMPONENT end		
[{	--- OBSERVATION begin		
OBX	Observation/Result		7
[{ NTE }]	Notes and Comments (for OBX)		2
}]	--- OBSERVATION end		
[{ FT1 }]	Financial Transaction		6
[BLG]	Billing Segment		6
}	--- ORDER end		

Table 7 is an extract from the HL7 v2.4 standards. It illustrates the full Health Level 7 International version 2.4 abstract message type used to carry dispensing information. For further information, please see www.hl7.org.

Table 7. HL7 v2.4 RDS^O13 abstract message type

RDS^O13^RDS_O13	Pharmacy/Treatment Dispense Message	Status	Chapter
MSH	Message Header		2
[{ SFT }]	Software		2
[UAC]	User Authentication Credential		2
[{ NTE }]	Notes and Comments (for Header)		2
[	--- PATIENT begin		
PID	Patient Identification		3
[PD1]	Additional Demographics		3
[{ NTE }]	Notes and Comments (for PID)		2
[{ AL1 }]	Allergy Information		2
[	--- PATIENT_VISIT begin		
PV1	Patient Visit		3
[PV2]	Patient Visit - Additional Info		3
]	--- PATIENT_VISIT end		
]	--- PATIENT end		
{	--- ORDER begin		
ORC	Common Order		4
[{	--- TIMING begin		
TQ1	Timing/Quantity		4
[{ TQ2 }]	Timing/Quantity Order Sequence		4
}]	--- TIMING end		
[	--- ORDER_DETAIL begin		
RXO	Pharmacy /Treatment Order		4
[	--- ORDER_DETAIL_SUPPLEMENT begin		
{ NTE }	Notes and Comments (for RXO)		2
{ RXR }	Pharmacy/Treatment Route		4
[{	--- COMPONENT begin		
RXC	Pharmacy/Treatment Component		4
[{ NTE }]	Notes and Comments (for each RXC)		2
}]	--- COMPONENT end		
]	--- ORDER_DETAIL_SUPPLEMENT end		
]	--- ORDER_DETAIL end		
[	--- ENCODING begin		
RXE	Pharmacy/Treatment Encoded Order		4
[{ NTE }]	Notes and Comments (for RXE)		2
{	--- TIMING_ENCODED begin		
TQ1	Timing/Quantity		4
[{ TQ2 }]	Timing/Quantity Order Sequence		4
}	--- TIMING_ENCODED end		
{ RXR }	Pharmacy/Treatment Route		4
[{ RXC }]	Pharmacy/Treatment Component		4
]	--- ENCODING end		
RXD	Pharmacy/Treatment Dispense		4
[{ NTE }]	Notes and Comments (for RXD)		2
{ RXR }	Pharmacy/Treatment Route		4
[{ RXC }]	Pharmacy/Treatment Component		4
[{	--- OBSERVATION begin		
OBX	Results		7
[{ NTE }]	Notes and Comments (for OBX)		2
}]	--- OBSERVATION end		
[{ FT1 }]	Financial Transaction segment		6
}	--- Order ends		

Appendix E FHIR resources

Table 8 is an extract from the HL7 FHIR standard. It illustrates the full Health Level 7 International Fast Healthcare Interoperability Resources standard used to carry prescribing information.

Table 8. FHIR MedicationRequent Resource

Name	Flags	Card.	Type	Description & Constraints
MedicationRequest			DomainResource	Ordering of medication for patient or group Elements defined in Ancestors: id, meta, implicitRules, language, text, contained, extension, modifierExtension
identifier		0..*	Identifier	External ids for this request
definition	Σ	0..*	Reference(ActivityDefinition | PlanDefinition)	Protocol or definition
basedOn	Σ	0..*	Reference(CarePlan | MedicationRequest | ProcedureRequest | ReferralRequest)	What request fulfills
groupIdentifier	Σ	0..1	Identifier	Composite request this is part of
status	?!Σ	0..1	code	active | on-hold | cancelled | completed | entered-in-error | stopped | draft | unknown MedicationRequestStatus (Required)
intent	?!Σ	1..1	code	proposal | plan | order | instance-order MedicationRequestIntent (Required)
category		0..1	CodeableConcept	Type of medication usage MedicationRequestCategory

				(Preferred)
priority	Σ	0..1	code	routine | urgent | stat | asap MedicationRequestPriority (Required)
medication[x]	Σ	1..1		Medication to be taken SNOMED CT Medication Codes (Example)
medicationCodeableConcept			CodeableConcept	
medicationReference			Reference(Medication)	
subject	Σ	1..1	Reference(Patient | Group)	Who or group medication request is for
context		0..1	Reference(Encounter | EpisodeOfCare)	Created during encounter/admission/stay
supportingInformation		0..*	Reference(Any)	Information to support ordering of the medication
authoredOn	Σ	0..1	dateTime	When request was initially authored
requester	ΣI	0..1	BackboneElement	Who/What requested the Request *+ onBehalfOf can only be specified if agent is practitioner or device*
agent	Σ	1..1	Reference(Practitioner | Organization | Patient | RelatedPerson | Device)	Who ordered the initial medication(s)
onBehalfOf	ΣI	0..1	Reference(Organization)	Organization agent is acting for
recorder		0..1	Reference(Practitioner)	Person who entered the request
reasonCode		0..*	CodeableConcept	Reason or indication for writing the prescription

				Condition/Problem/Diagnosis Codes (Example)
reasonReference		0..*	Reference(Condition | Observation)	Condition or Observation that supports why the prescription is being written
note		0..*	Annotation	Information about the prescription
dosageInstruction		0..*	Dosage	How the medication should be taken
dispenseRequest		0..1	BackboneElement	Medication supply authorization
validityPeriod		0..1	Period	Time period supply is authorized for
numberOfRepeatsAllowed		0..1	positiveInt	Number of refills authorized
quantity		0..1	SimpleQuantity	Amount of medication to supply per dispense
expectedSupplyDuration		0..1	Duration	Number of days supply per dispense
performer		0..1	Reference(Organization)	Intended dispenser
substitution		0..1	BackboneElement	Any restrictions on medication substitution
allowed	?!	1..1	boolean	Whether substitution is allowed or not
reason		0..1	CodeableConcept	Why should (not) substitution be made SubstanceAdminSubstitutionReason (Example)
priorPrescription		0..1	Reference(MedicationRequest)	An order/prescription that is being replaced
detectedIssue		0..*	Reference(DetectedIssue)	Clinical Issue with action
eventHistory		0..*	Reference(Provenance)	A list of events of interest in the lifecycle

Table 9 is an extract from the HL7 FHIR standard. It illustrates the full Health Level 7 International Fast Healthcare Interoperability Resources standard used to carry dispensing information. For further information, please see www.hl7.org.

Table 9. FHIR MedicationDispense Resource

Name	Flags	Card.	Type	Description & Constraints
MedicationDispense	I		DomainResource	Dispensing a medication to a named patient + *whenHandedOver cannot be before whenPrepared* Elements defined in Ancestors: id, meta, implicitRules, language, text, contained, extension, modifierExtension
identifier		0..*	Identifier	External identifier
partOf		0..*	Reference(Procedure)	Event that dispense is part of
status	?!Σ	0..1	code	preparation | in-progress | on-hold | completed | entered-in-error | stopped MedicationDispenseStatus (Required)
category		0..1	CodeableConcept	Type of medication dispense MedicationDispenseCategory (Preferred)
medication[x]	Σ	1..1		What medication was supplied SNOMED CT Medication Codes (Example)
medicationCodeableConcept			CodeableConcept	
medicationReference			Reference(Medication)	
subject	Σ	0..1	Reference(Patient | Group)	Who the dispense is for
context		0..1	Reference(Encounter |	Encounter / Episode

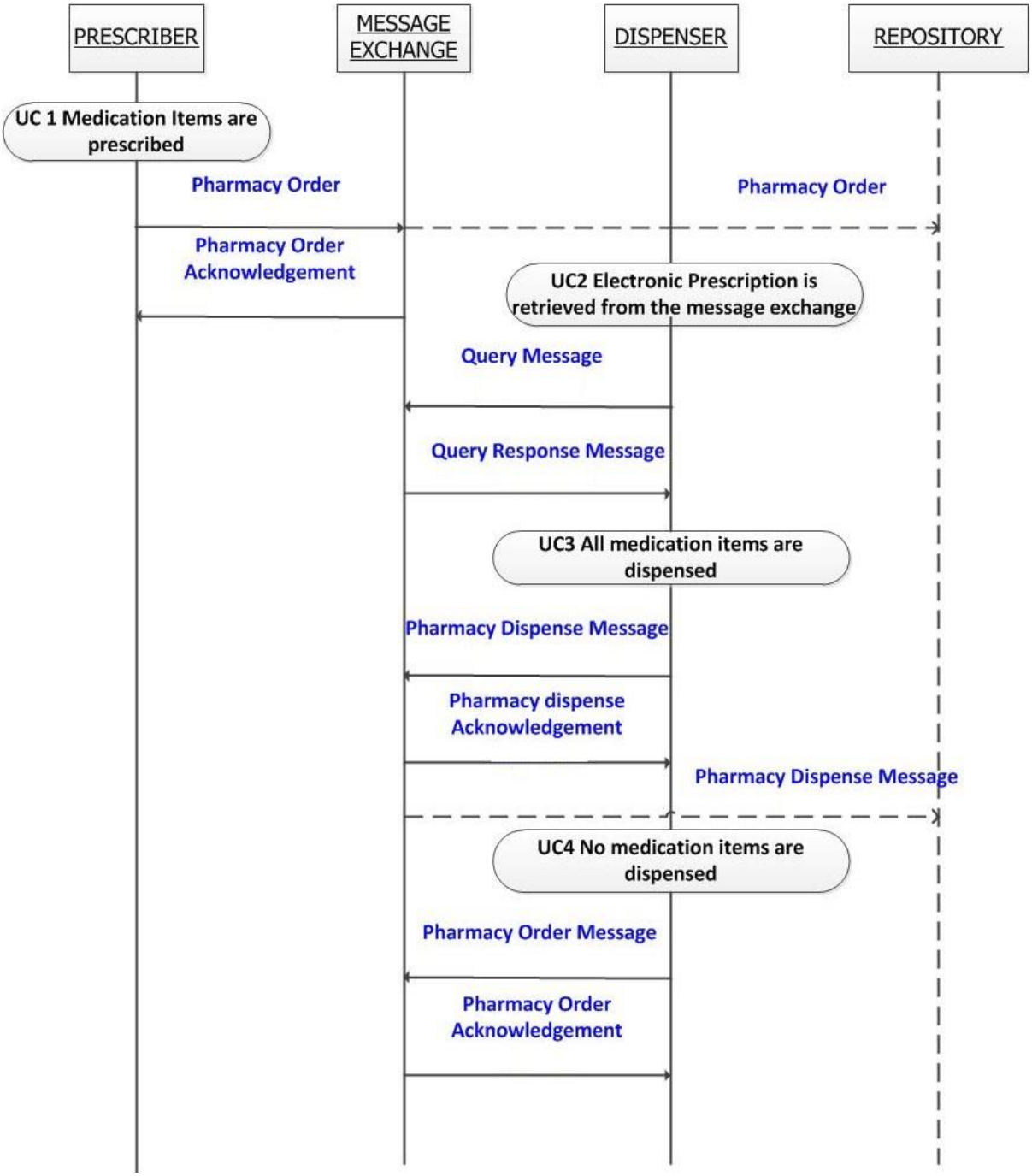
			EpisodeOfCare)	associated with event
supportingInformation		0..*	Reference(Any)	Information that supports the dispensing of the medication
performer		0..*	BackboneElement	Who performed event
actor		1..1	Reference(Practitioner | Organization | Patient | Device | RelatedPerson)	Individual who was performing
onBehalfOf		0..1	Reference(Organization)	Organization organization was acting for
authorizingPrescription		0..*	Reference(MedicationRequest)	Medication order that authorizes the dispense
type		0..1	CodeableConcept	Trial fill, partial fill, emergency fill, etc. ActPharmacySupplyType (Example)
quantity		0..1	SimpleQuantity	Amount dispensed
daysSupply		0..1	SimpleQuantity	Amount of medication expressed as a timing amount
whenPrepared	Σ	0..1	dateTime	When product was packaged and reviewed
whenHandedOver		0..1	dateTime	When product was given out
destination		0..1	Reference(Location)	Where the medication was sent
receiver		0..*	Reference(Patient | Practitioner)	Who collected the medication
note		0..*	Annotation	Information about the dispense
dosageInstruction		0..*	Dosage	How the medication is to be used by the patient or administered by the caregiver
substitution		0..1	BackboneElement	Whether a substitution was performed on the dispense

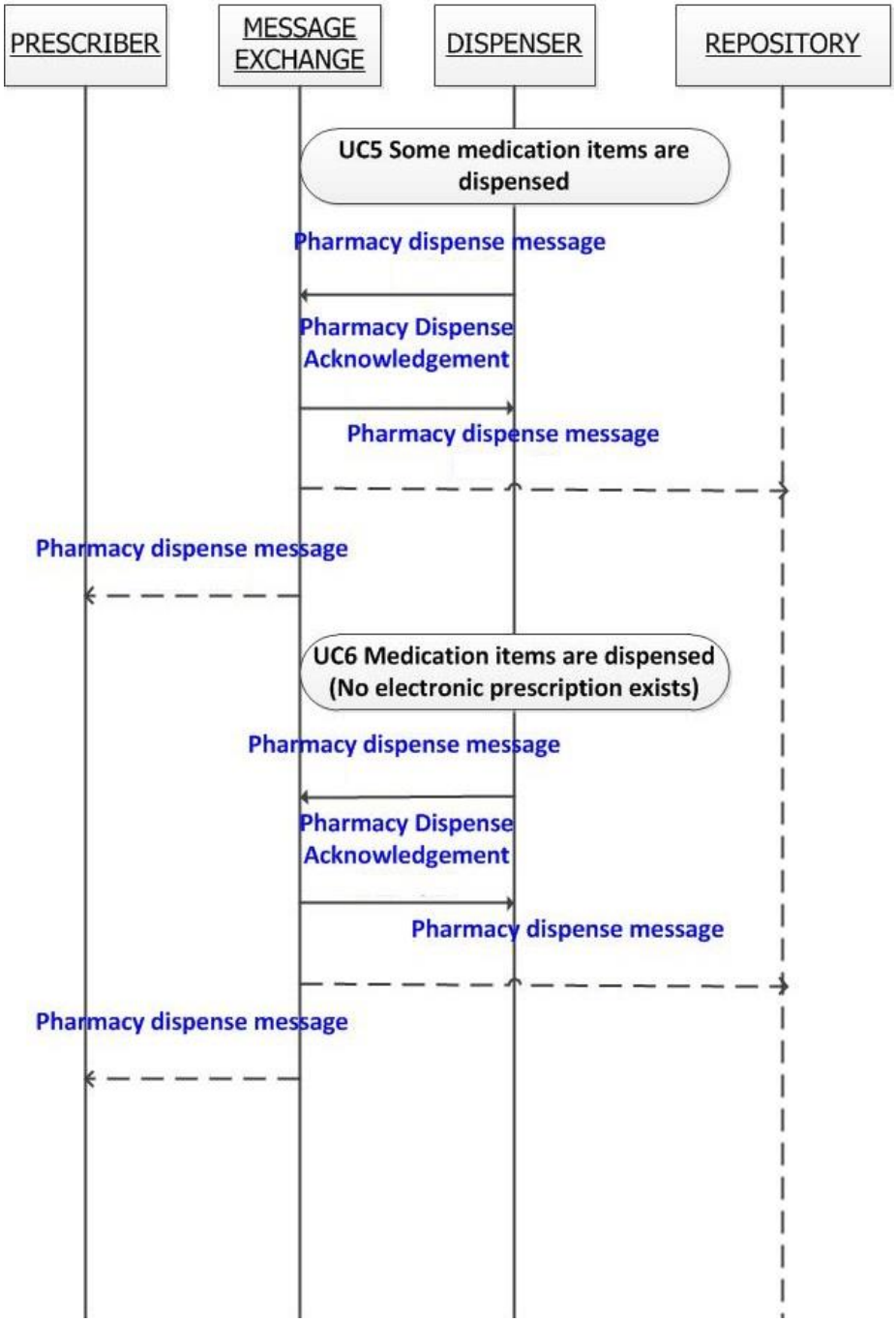
wasSubstituted		1..1	boolean	Whether a substitution was or was not performed on the dispense
type		0..1	CodeableConcept	Code signifying whether a different drug was dispensed from what was prescribed ActSubstanceAdminSubstitutionCode (Example)
reason		0..*	CodeableConcept	Why was substitution made SubstanceAdminSubstitutionReason (Example)
responsibleParty		0..*	Reference(Practitioner)	Who is responsible for the substitution
detectedIssue		0..*	Reference(DetectedIssue)	Clinical issue with action
notDone		0..1	boolean	Whether the dispense was or was not performed
notDoneReason[x]		0..1		Why a dispense was not performed
	notDoneReasonCodeableConcept		CodeableConcept	
	notDoneReasonReference		Reference(DetectedIssue)	
eventHistory		0..*	Reference(Provenance)	A list of releveant lifecycle events

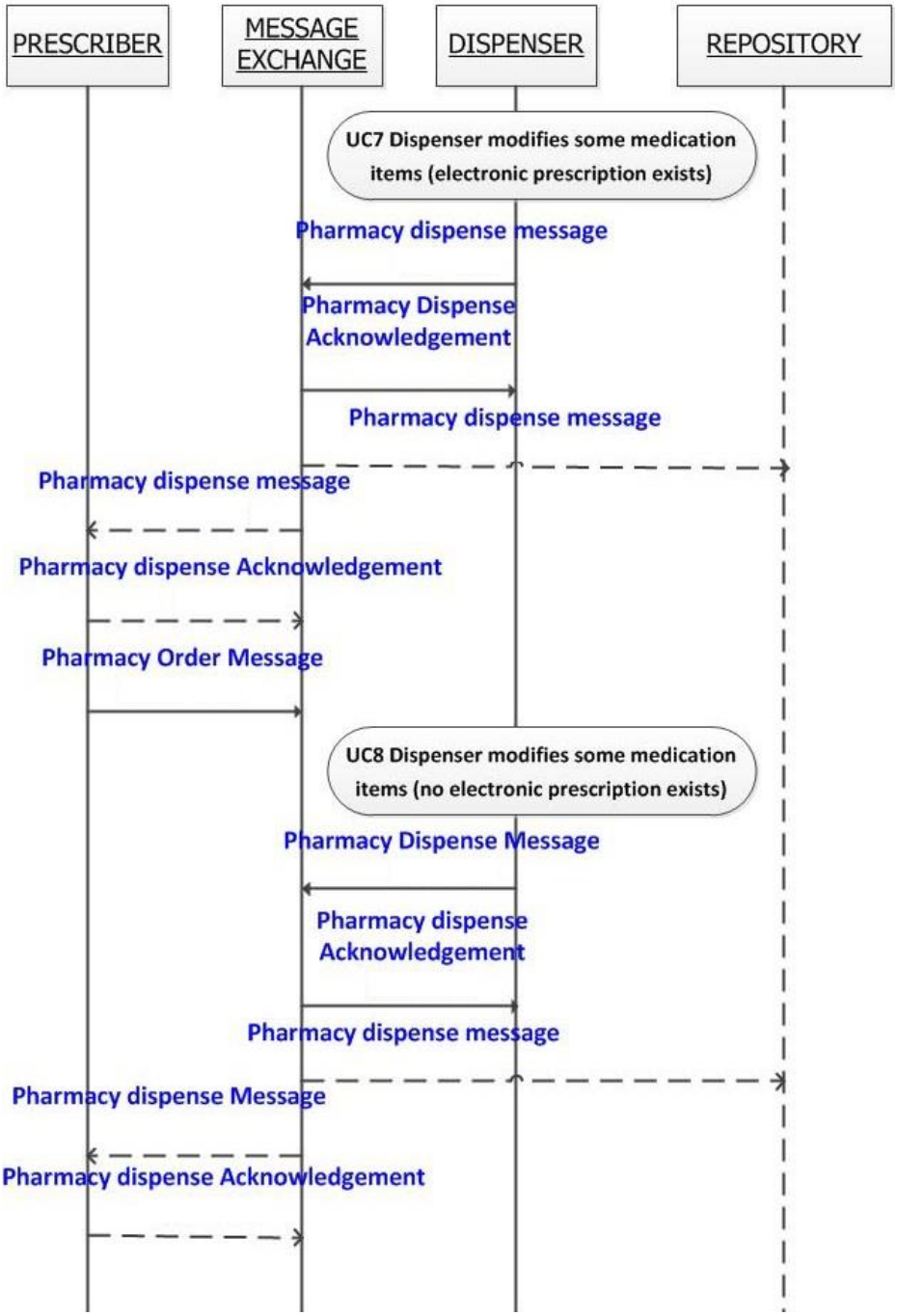
Appendix F Message flows

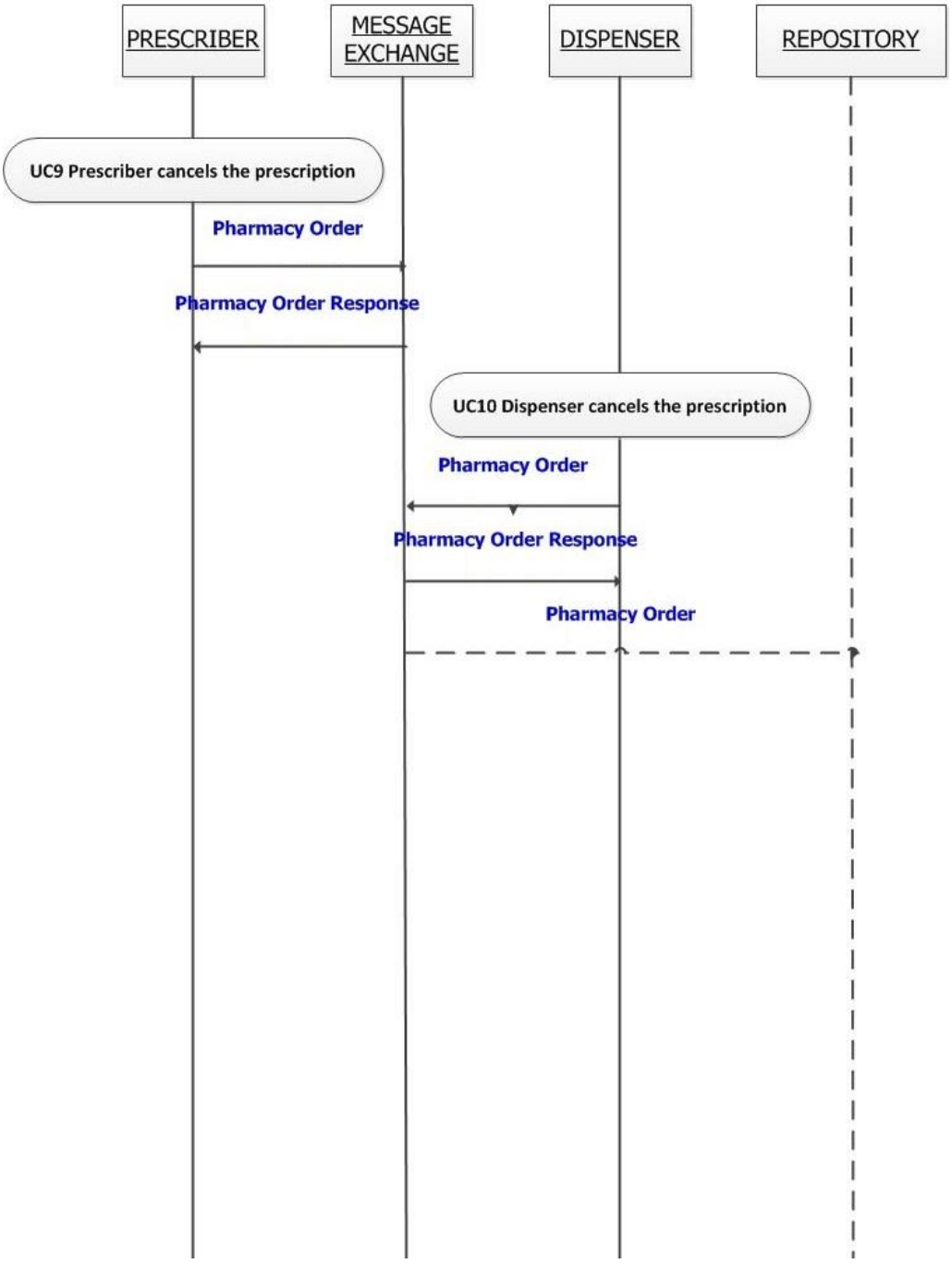
Figure 3 illustrates message flows that are required to support the transfer of information between prescribers and pharmacists for each of the use cases identified in Chapter 2.

Figure 3. Message flows for transfer for information between prescribers and pharmacists




PRESCRIBER
MESSAGE EXCHANGE
DISPENSER
REPOSITORY
UC5 Some medication items are dispensed
Pharmacy dispense message
Pharmacy Dispense Acknowledgement
Pharmacy dispense message
Pharmacy dispense message
UC6 Medication items are dispensed (No electronic prescription exists)
Pharmacy dispense message
Pharmacy Dispense Acknowledgement
Pharmacy dispense message
Pharmacy dispense message


PRESCRIBER
MESSAGE EXCHANGE
DISPENSER
REPOSITORY
UC7 Dispenser modifies some medication items (electronic prescription exists)
Pharmacy dispense message
Pharmacy Dispense Acknowledgement
Pharmacy dispense message
Pharmacy dispense message
Pharmacy dispense Acknowledgement
Pharmacy Order Message
UC8 Dispenser modifies some medication items (no electronic prescription exists)
Pharmacy Dispense Message
Pharmacy dispense Acknowledgement
Pharmacy dispense message
Pharmacy dispense Message
Pharmacy dispense Acknowledgement


PRESCRIBER
MESSAGE EXCHANGE
DISPENSER
REPOSITORY
UC9 Prescriber cancels the prescription
Pharmacy Order
Pharmacy Order Response
UC10 Dispenser cancels the prescription
Pharmacy Order
Pharmacy Order Response
Pharmacy Order

References

1. Health Information and Quality Authority (HIQA). *ePrescribing and Electronic Transfer of Prescriptions: An International Review*. 2013 Available from: https://www.hiqa.ie/reports-and-publications/health-information/eprescribing-and-electronic-transfer-prescriptions. Accessed on: 28 June 2018.

2. Health Information and Quality Authority. *ePrecsribing: An International Review*. 2018. https://www.hiqa.ie/reports-and-publications/health-information/eprescribing-international-review. Accessed on: 28 June 2018

3. Mcelligott A Brennan J, Power A. *Adoption of National Electronic Prescribing Services in Primary Care in Europe - Policy Lessons for Ireland*. 2015. Available from: https://ulir.ul.ie/handle/10344/4827. Accessed on: 28 June 2018

4. Department Of Health. *eHealth Strategy for Ireland*. Department of Health. 2013. Available from: http://www.ehealthireland.ie/Knowledge-Information-Plan/eHealth-Strategy-for-Ireland.pdf Accessed on: 28 June 2018

5. Health Information and Quality Authority (Hiqa). *ePrescription Dataset and Clinical Document Architecture Standard*. 2015. Available from: https://www.hiqa.ie/sites/default/files/2017-01/ePrescribing-Dataset_and_CDA_Specification.pdf. Accessed on: 28 June 2018

6. Health Information and Quality Authority (HIQA). *Data model for an electronic medicinal product reference catalogue - a National Standard.* 2015. Available from: https://www.hiqa.ie/reports-and-publications/health-information/data-model-electronic-medicinal-product-reference. Accessed on: 16 July 2018

7. Health Information and Quality Authority (HIQA). *National Standard for a Dispensing Note including a Clinical Document Architecture specification*. 2017. Available from: https://www.hiqa.ie/reports-and-publications/health-information/national-standard-dispensing-note-including-clinical. Accessed on: 16 July 2018

8. Centers for Medicare and Medicaid Services. *E-Prescribing*. 2014. Available from: https://www.cms.gov/Medicare/E-Health/Eprescribing/index.html. Accessed on: 16 July 2018

9. Australian Government Department Of Health. *Fifth Community Pharmacy Agreement*. 2010. https://www.health.gov.au/internet/main/publishing.nsf/Content/8D21C5E188499A03CA257BF0001C963A/$File/5CPA%20Agreement%2005%20August%202010.pdf. Accessed on: 16 July 2018

10. Mcelligott A Brennan J, Power A. *National health models and the adoption of eHealth and ePrescribing in primary care - new evidence from Europe*. 2015. Available from: https://hijournal.bcs.org/index.php/jhi/article/view/97. Accessed on: 16 July 2018

11. Joint Action to Support Ehealth Network. *The electronic exchange of health data under Cross-Border Directive 2011/24/EU - Release 2 - ePrescriptions and eDispensations*. 2016. Available from: https://ec.europa.eu/health//sites/health/files/ehealth/docs/eprescription_guidelines_en.pdf. Accessed on: 16 July 2018

12. Deetjen. *European E-Prescriptions: Benefits and Success Factors*. 2016. Available from: https://www.politics.ox.ac.uk/materials/publications/15224/workingpaperno5ulrikedeetjen.pdf. Accessed on: 16 July 2018

13. Social Services and Public Safety Department of Health. *Electronic Prescribing and Eligibility System*. 2006. Available from: http://www.i2-health.eu/eprescribing2006/parallel-session-aa/a-2-davis-northern-ireland-release-1-1.pdf. Accessed on: 16 July 2018

14. . European Patients Smart Open Services. *Work Package 3.9 – Appendix B1/B2 epSOS Semantic Implementation Guidelines. https://ec.europa.eu/D3.9.1_Appendix_B1_B2_Implementation_v1.4_20110725.pdf .* 2011. Accessed on: 28 June 2018

15. Integrating the Healthcare Enterprise, Pharmacy, Community Medication Prescription and Dispense. *Technical Framework, Trial Implementation* (2015) Available at: http://www.ihe.net. Accessed on: 28 June 2018

16. Digital Health Australian. *National Requirements for electronic prescriptions version 1.0*. 2017. Available at: https://www.digitalhealth.gov.au/implementation-resources/ehealth-foundations/electronic-prescribing. Accessed on: 28 June 2018

17. Health Level Seven International. Messaging Standards — version 2.4, verson 2.6, version 2.7. Available at: http://www.hl7.org. Accessed on: 28 June 2018

18. Health Level Seven International. HL7 Fast Healthcare Interoperability Resources standard (FHIR). Available at: http://www.hl7.org. Accessed on: 28 June 2018

19. openEHR. Clinical Knowledge Manager Medication Order Archetype· Available at: https://www.openehr.org/ckm. Accessed on: 28 June 2018

20. Electronic Pharmaceutical Messaging Standards, HISO 10030.2:2008. Available at: https://www.health.govt.nz/publication/hiso-1003022008-electronic-pharmaceutical-messaging-standard. Accessed on: 28 June 2018

21. National council for prescription Drug programs. Available at https://www.ncpdp.org/home. Accessed on: 28 June 2018

22. Health Level Seven International. *HL7/ASTM Implementation Guide for CDAR2 - Continuity of Care Document Release 1*.Available at: http://www.hl7.org/implement/standards/product_brief.cfm?product_id=6. Accessed on: 28 June 2018

Health Information and Standards Directorate
Health Information and Quality Authority
Unit 1301, City Gate,
Mahon,
Cork
T12 Y2XT