



Implementation of Health Level Seven (HL7) Version 2.5

Part 3: Electronic messages for exchange of information on medicines prescription



This Australian Standard® was prepared by Committee IT-014, Health Informatics. It was approved on behalf of the Council of Standards Australia on 31 July 2014. This Standard was published on 18 August 2014.

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Standards Australia wishes to acknowledge the participation of the expert individuals that contributed to the development of this Standard through their representation on the Committee and through the public comment period.

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Australian Standard[®]

Implementation of Health Level Seven (HL7) Version 2.5

Part 3: Electronic messages for exchange of information on medicines prescription

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PREFACE

This Australian Standard was prepared by the Standards Australia Technical Committee IT-014, Health Informatics, in response to requests from the health informatics community, to supersede AS 4700.3(Int)—2007, *Implementation of Health Level Seven (HL7) Version 2.5, Part 3: Electronic messages for exchange of information on drug prescription*.

The Standards Australia Technical Committee IT-014 recognizes the work of the Standards Australia Working Group IT-014-06-04, Prescription Messaging, in the preparation of this Standard.

It covers implementation of the Health Level Seven (HL7) Version 2.5 protocol, for communication between prescribers, dispensers and their healthcare trading partners in Australia. It is based on AS 4700.3—2005, the corresponding implementation guide for HL7 Version 2.4, and incorporates differences between HL7 Version 2.4 and HL7 Version 2.5.

Attention is drawn to the fact that Standards Australia has published a series of Australian Technical Specifications (the ATS 4888 series) for Electronic Transfer of Prescriptions (ETP), which is based on HL7 Clinical Document Architecture Release 2 (CDA) XML document. The primary aim of the ATS 4888 series is to guide implementers in the use of a CDA based working model for ETP in the community sector.

Potential users of this Australian Standard are advised to check with the relevant authorities as to the architecture and the information model required to support ETP in the intended use environment before they commence implementation of this Australian Standard.

Notwithstanding the publication of this document, the following documents remain current:

- (a) AS 4700.3—2005, *Implementation of Health Level Seven (HL7) Version 2.4, Part 3: Electronic messages for exchange of information on drug prescription*, which remains current in respect of HL7 Version 2.4 implementations.
- (b) AS/NZS 4700.3:2002, *Implementation of Health Level Seven (HL7) Version 2.3.1, Part 3: Electronic messages for exchange of information on drug prescription*, which remains current in respect of HL7 Version 2.3.1 implementations.
- (c) AS/NZS 4700.3:1999, *Implementation of Health Level Seven (HL7) Version 2.3, Part 3: Electronic messages for exchange of information on drug prescription*, which remains current in respect of HL7 Version 2.3 implementations.

In this document, frequent reference is made to AS 4700.1—2006, *Implementation of Health Level Seven (HL7) Version 2.5, Part 1: Patient administration*, which covers the implementation of HL7 Version 2.5 for patient administration within and between Australian healthcare settings. AS 4700.1 provides an important foundation for the building of most clinical healthcare messages.

Funding for this publication has been provided by the Commonwealth Department of Health. The Commonwealth makes no representation or warranty that the information in this publication is correct and accurate.

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FOREWORD

This version of AS 4700.3 was prepared following a workshop involving consultation with a broad spectrum of interested parties to gain input into redesigning the way this document has been formed. The previous version of AS 4700.3 was considered by some to be difficult to understand, particularly in relation to the way HL7 messages were to be used. This version of the Standard has used UML diagrams to show the interaction of HL7 messages.

The Standards Australia Working Group IT-014-06-04, Prescription Messaging, has reviewed and interpreted data segments and data elements that are mandatory (required), conditional (required, based on a condition) or optional, and relevant usage notes in the Australian health environment.

In the preparation of this Australian Standard, cognizance was taken of the work being done by other parties with regard to patient confidentiality and adverse medicines reactions.

In the initial development of AS/NZS 4700.3:1999, a number of meetings were convened involving representatives from a wide range of organizations in the health sector and from others interested in the health sector. The organizations represented in the field of pharmacy came from State Pharmacy Boards, the Pharmaceutical Society of Australia, the Pharmacy Guild, the Society of Hospital Pharmacists, various levels of the pharmaceutical industry, and community and Defence pharmacy bodies. The medical profession was represented by clinicians and administrators, and other health professionals were represented at various times. The software industry, business consultancies, academia, the engineering profession and the Consumer Health Forum also participated. A detailed object model was developed to identify all potential information interchanges between participants, not only directly in the passing of prescriptions, but also in seeking and providing medicine information, reporting adverse medicine reactions, and seeking authorization for and notifying the dispensing of specific medicines.

The purpose of this model was to determine how well HL7 would address Australian needs, which were deliberately ambitious, and then to determine how each identified requirement would be satisfied by HL7.

An arbitrary boundary was placed around the area of interest, since it is conceivable that every piece of knowledge is in some way related to a medical prescription. It was decided that the manufacturer of medicines lay on the boundary, and that advising the manufacturer of an adverse medicine reaction lay within the area of interest, but that ordering supplies from a manufacturer lay outside. The purpose of this limitation was to limit the interchanges considered—it in no way limits HL7 usage *per se*.

The previous edition of this Standard, AS 4700.3—2005, was based on an object-oriented data model that identified the players that needed to communicate with each other in a preferred electronic future. Since then, the Standard has been implemented and its value confirmed.

HL7 is a healthcare application protocol accredited as a Standard by the American National Standards Institute. ‘Level Seven’ refers to the highest level of the International Organization for Standardization communications model for Open Systems Interconnection (OSI)—the application level. Items within the application level include definition of the data to be exchanged, the timing of the exchange, and communication of certain errors to the application. This level supports such functions as security checks, participant identifications, availability checks, the negotiation of exchange mechanisms and, importantly, structuring the data exchanges themselves.

HL7 focuses on the interface requirements of the entire healthcare organization. It allows development along the fastest possible track to the unique requirements of already installed hospital and departmental systems, some of which use mature technologies.

Australia already has an existing base of healthcare institutions that use the HL7 protocol to exchange key sets of data between different computer application systems. While HL7 is concerned with addressing immediate needs, there is a very strong focus on convergence with other Standards development activities in the United States of America and international HL7 initiatives in countries such as Canada, Finland, Germany, India, Japan, the Netherlands, South Africa and the United Kingdom.

The HL7 protocol is a collection of standard formats that specify the implementation of interfaces between computer applications. It is not rigid. Flexibility is built into the protocol to allow compatibility for specialized data sets that have facility-specific needs. One of HL7's strengths is its inbuilt flexibility. However, that flexibility is also one of its weaknesses. It is open to misinterpretation in its structure and format.

HL7 is based on the health environment in the USA. Implementation of the HL7 Version 2.5 Standard in the Australian health environment requires a common and consistent approach which is enabled by the creation of Standards relevant to the Australian context.

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STANDARDS AUSTRALIA

Australian Standard**Implementation of Health Level Seven (HL7) Version 2.5****Part 3: Electronic messages for exchange of information on medicines prescription****1 SCOPE**

This Australian Standard covers implementation of electronic messages for exchange of information on medicines prescriptions in the community and hospital environment using the Health Level Seven (HL7) Version 2.5 protocol.

This Standard provides consistent use of data definitions as well as commentary and references to the International Organization for Standardization (ISO) and the National Health Data Dictionary.

For the purposes of this Standard, only human patients are considered.

This Standard does not deal with commercial transactions with suppliers.

2 APPLICATION

This Standard is a guide for use by health authorities, healthcare providers, healthcare institutions, health information technology vendors, health information technology consultants, the health informatics community and the general public.

This is not a stand-alone document. A good understanding and, preferably, working knowledge of HL7 is essential, as this Australian Standard is based on and frequently refers to the HL7 Version 2.5 Protocol.

3 REFERENCED AND RELATED DOCUMENTS**3.1 Referenced documents**

The following documents are referred to in this Standard:

AS

4700.1—2006 Implementation of Health Level Seven (HL7) Version 2.5, Part 1: Patient administration

4700.6—2013 Implementation of Health Level Seven (HL7) Version 2.5, Part 6: Referral, discharge and health record messaging

HL7 V2.5 Health Level Seven Standard Version 2.5: Health Level Seven Inc., Ann Arbor, 2003. Available at <http://www.hl7.org/>

METeOR METeOR - AIHW 2010b. Metadata Online Registry (METeOR). Canberra: AIHW. <http://meteor.aihw.gov.au/content/index.phtml/itemId/181162>

TGAAAN For details of TGA ingredients and approved terminology, see TGA eBusiness Services at <https://www.ebs.tga.gov.au/>

3.2 Related documents

Attention is drawn to the following related documents:

AS

4700.2—2012 Implementation of Health Level Seven (HL7) Version 2.4, Part 2: Pathology and medical imaging (Diagnostics)

HB

234—2012 Healthcare identifier implementation guide

Australian Pharmaceutical Advisory Council, *Guiding principles to achieve continuity in medication management*, July 2005, APAC, Canberra.

Australian Medicines Terminology—the current version is available to terminology licence holders at <http://www.nehta.gov.au/our-work/clinical-terminology/australian-medicines-terminology>

4 DEFINITIONS

For the purpose of this document, the definitions below apply.

4.1 Administering medication

Act of ‘giving’ medication.

4.2 Admitted patient

Patient who undergoes a hospital’s admission process.

NOTE: Patients are admitted for one or more reasons including the need for clinical management, observation for assessment/diagnosis/medication needs, (a) procedure(s) that requires specialist support facilities/expertise, legal reasons (e.g. under mental health or child protection legislation) or if the patient is aged nine days or less (see NHDD Version 16 2012).

4.3 Authorized reviewer

Person who is accredited to deliver medication management services.

NOTE: Authorized reviewers include an Accredited Pharmacist who has completed an accreditation assessment program either with the Australian Association of Consultant Pharmacy or the Society of Hospital Pharmacists of Australia.

Refer to <http://www.aacp.com.au/> for further information regarding Accredited Pharmacists.

4.4 Approval body

Authority that controls any or all of evaluation, prescribing, supply, medicines approval, and payment. The Approval body is also known as the Regulator or Funder.

The Approval body is also known as the Regulator or Funder.

Examples include the following:

- (a) Organizations that insure patients and provide financial compensation for healthcare costs, e.g. general insurers and private health funds.
- (b) Department of Health—Commonwealth Government agency responsible for—
 - (i) ensuring that all Australians have access to necessary health services at reasonable cost (including Medicare and Pharmaceutical Benefits);
 - (ii) the promotion of good health through regulatory, promotional and funding programs (including therapeutic goods administration, drug abuse initiatives and health research);
 - (iii) the provision of care and services for aged people and people with disabilities; and
 - (iv) supporting families’ access to child care and family support.

- (c) Department of Veterans' Affairs—A Commonwealth Government agency which is responsible under the *Veterans Entitlement Act 1986* for the granting of benefits, including pharmaceutical items listed in the Repatriation Schedule of Pharmaceutical Benefits (RSPB).
- (d) Department of Human Services—A Commonwealth Government agency responsible for administrative activities for a range of health, social and welfare payments and services, including Medicare, which looks after the health of Australians through the efficient delivery of programs such as the Pharmaceutical Benefits Scheme (PBS), the Australian Childhood Immunisation Register and the Australian Organ Donor Register.
- (e) Insurance funds.
- (f) Registering authorities—Relevant state or territory authorities for the registration of a health provider.
- (g) State Health—State or territory government department responsible for the administration of health and related matters in that state or territory.

4.5 Dispenser

Person authorized under relevant legislation to supply prescribed therapeutic products to a patient (or their agent) in accordance with the legislation and standards applicable to that person's practice.

4.6 Dispensing

Preparation and supply of a therapeutic product on the prescription or order of a prescriber, for the use by a patient, which ensures as far as possible that the patient receives the correct therapeutic product in the correct strength, dose, form and quantity.

NOTE: The above should be supplied, appropriately packaged and labelled such that the patient or carer understands the directions for the safe and effective use of the therapeutic product.

Dispensing does not include the administration of medication to a patient.

4.7 Dose administrant

Person who administers the medication.

4.8 May

Indicates the existence of an option.

4.9 Medication order

Instruction from a prescriber to supply and/or administer a medication to a patient.

NOTE: Medication order includes a prescription and a verbal order.

4.10 Medicine

Product containing one of more active ingredients, administered with therapeutic intent for the treatment or prevention of disease or for restoration, modification of physiological functions by exerting a pharmacological, immunological or metabolic action, or for making a medical diagnosis.

NOTE: In this context, 'medicine' is a product and is not used to identify the discipline of medicine which is the science and practice of diagnosis, treatment and disease prevention and the maintenance.

4.11 Medicines information source

Repository of accurate data about therapeutic products and their use.

4.12 Non-admitted patient

A patient who does not undergo a hospital's formal admission process.

NOTE: This includes an emergency department patient, outpatient, and other non-admitted patient (see NHDD Version 16 2012; AS 4700.1—2006).

4.13 Order

Synonym: Medication Order.

Context: Prescribing.

4.14 Order detail segment

One of several HL7 segments that can carry order information.

NOTE: An example is the OBR segment. In the context of HL7 messages a segment is a logical group of data fields. They may occur only once in a message or they may be allowed to repeat.

4.15 Patient

Person for whom a prescription, order or advice, or a combination of these, is issued.

Context: Therapeutic goods.

4.16 Patient's agent

A person who receives a prescription, order or advice, or a combination of these on behalf of a patient.

NOTE: This includes the following:

- (a) *Carer*—person (other than parent/guardian) who provides care for a patient including relative, nurse or other formal or informal caregiver, e.g. non-professional healthcare provider, neighbour.
- (b) *Parent/guardian*.
- (c) *Other*—any other person authorized by the patient to receive a prescription on the patient's behalf.

4.17 Patient medication record

Health record of the prescribing, supply, provision of advice or use of a medicine by a patient, or a combination of these.

NOTES:

- 1 The health record may contain details of the use of over the counter and complementary medicines. The record may be retained in any format including: electronica, digitized, transitional, hybrid or hard copy. Electronic format may include a record on a computer hard disk, distributed database record, or other forms, e.g. access card.
- 2 A health record may be created and maintained by a prescriber, dispenser, patient or patient's agent.

4.18 Prescriber

Healthcare professional who has prescribing privileges based on the regulatory environment in the jurisdiction in which they practice.

4.19 Prescription

Formal medication order (printed or electronic) complying with all regulatory requirements.

Context: Therapeutic goods.

4.20 Repository

Implementation of a collection of information along with data access and control mechanisms.

NOTE: This includes searching, indexing, storage, retrieval and security functionality.

4.21 Shall

Indicates that a statement is mandatory.

4.22 Should

Indicates a recommendation.

4.23 Therapeutic product

Medicine or therapeutic device.

4.24 Trigger event

Event which, when recorded or recognized by an application, indicates the need for an information flow to one or more other applications, resulting in one or more interactions.

NOTE: Action that takes place in an application, based on some predefined condition such as an admission, ward transfer, or placement of an order. The action usually results in the compilation and transmission of a data message. [From AS 4700.1—2006.]

5 OVERVIEW**5.1 General**

This Clause (5.1) provides an introduction to the usage of HL7 messages in the Australian context, and in particular provides a ‘how to’ pointer on the subsequent Clauses. This Clause attempts to assist developers to identify appropriate ways to construct messages for a given purpose.

It has been found by some developers when attempting to implement the HL7 Standard that there appear to be either a number of possible ways of passing certain data between systems or applications, or none at all, and that it can take a significant amount of time to search the full Standard for the relevant information. To reduce the complexity of implementing the HL7 Standard in Australia and to encourage use of the Standard, the following steps should be completed:

- (a) Identify the participants involved in exchange of prescriptions and related data.
- (b) Identify the individual interchanges that need to be handled. These interchange diagrams (footnote linking to diagrams in the Standard) show which messages are used, such as notifying a suspected adverse medicine reaction, placing a prescription with a dispenser, or advising an authority of the usage of controlled substances.
- (c) Each interchange diagram shows not only which message to use, but also some of the order control codes to use in the ORC segments.

5.2 Diagrams**5.2.1 General**

This version of the Standard has adopted a different approach to previous versions of AS 4700.3 defining the functions in the electronic exchange of prescription data. There are two sets of diagrams: diagrams showing the specific functions in this interchange of prescription data (Clause 5.2.2), and diagrams showing detailed message interactions (Clause 5.2.3) between the respective actors. Actors can be people or information systems.

Each function flow diagram indicates the specific message types to be used for each interaction in that diagram—for example, M1.

This Clause, 5.2, details the message interactions between systems for the functions defined. Each diagram in Clause 5.2 details the message and event types used when sending these messages. There are two messages in each diagram; the first is the initiating message and the second is the application acknowledgement message. In HL7 there is also an accept acknowledgement as part of the HL7 paradigm; this is always an ACK message and is not shown in the diagrams for clarity.

See HL7 V2.5, Sections 2.3.2 and 2.3.3.

5.2.2 Function flow diagrams

5.2.2.1 Prescribing function

The prescribing function diagram (see Figure 1) shows the overall process of generating a prescription for medication and administering medication. The process commences with the patient presenting for consultation and then moves through the process that the prescriber takes to generate the order. This diagram also includes the need to seek approval from an approver if the need arises. The diagram is completed with the prescription finally being sent to the dispenser.

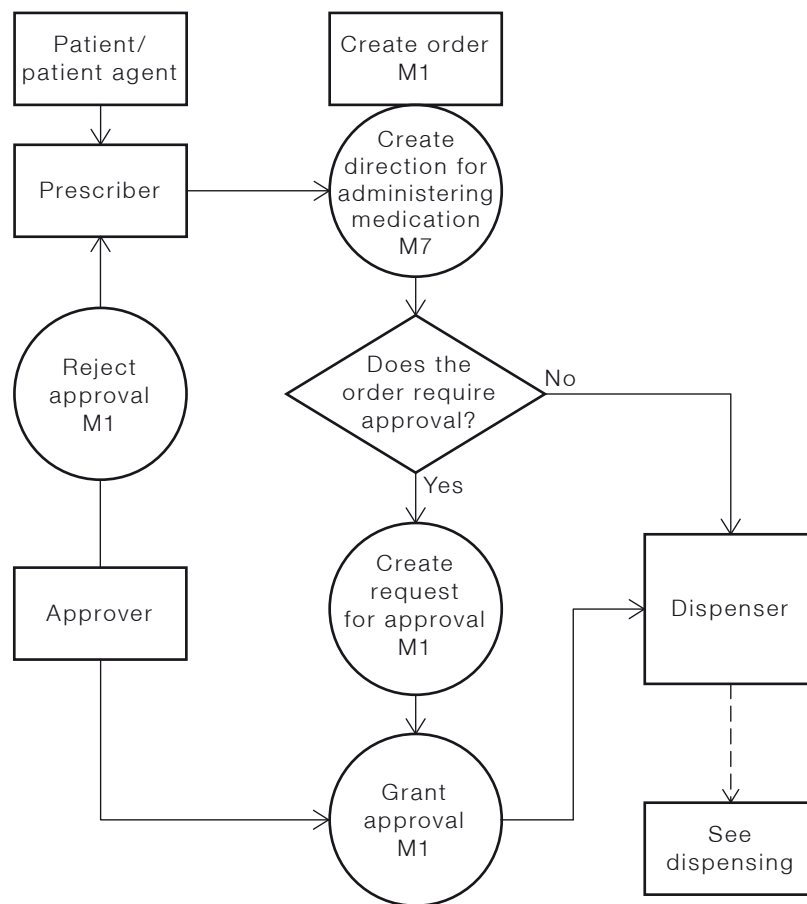


FIGURE 1 PRESCRIBING FUNCTION

5.2.2.2 Dispensing function

The dispensing function diagram (see Figure 2) shows the overall process of dispensing a medication order. The process commences with the dispenser receiving the medication order and then moves through the process the dispenser takes to dispense the medication. This diagram also includes the need to seek approval from an approver if the need arises, or to check with the prescriber if there is a problem with the medication order. If approval is rejected or the medication order needs clarification, the process returns to the prescribing function—see Figure 2. The process is completed with notification of dispensing.

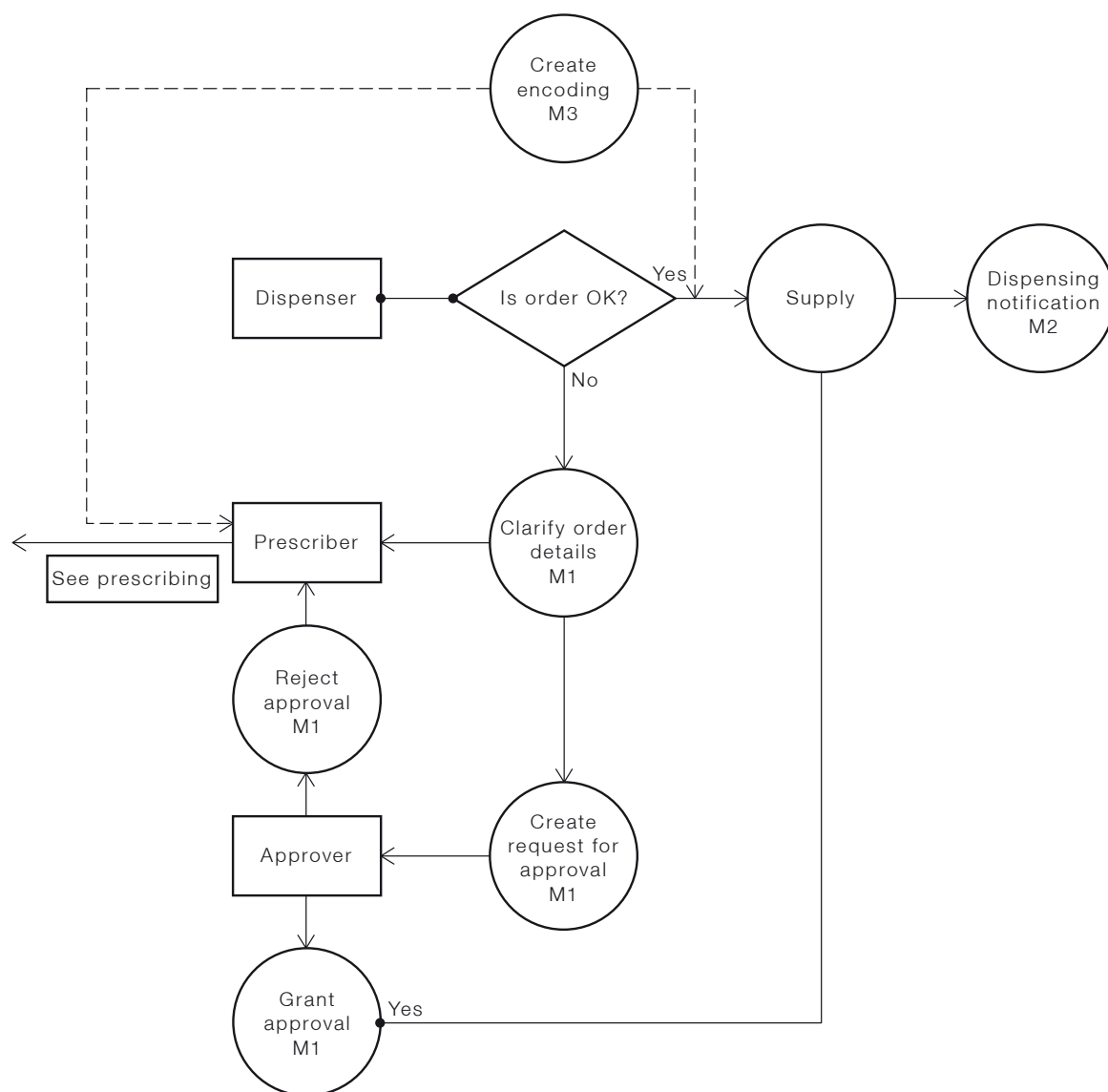


FIGURE 2 DISPENSING FUNCTION

5.2.2.3 Administration function

The administration function diagram (see Figure 3) shows the overall process of notification that a medication has been administered to the patient.

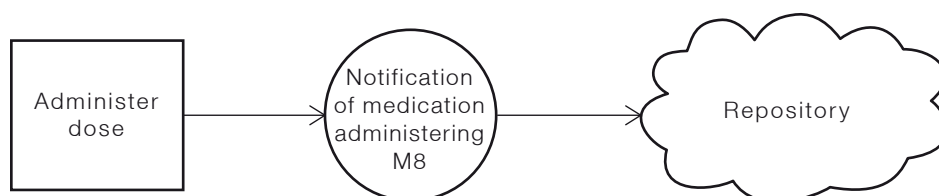


FIGURE 3 ADMINISTRATION FUNCTION

5.2.2.4 Medication history function

The medication history function diagram (see Figure 4) shows the overall process of requesting medication history for a patient or patients. The process commences with the dispenser/prescriber requesting a patient history from a central repository and then shows the return of the report.

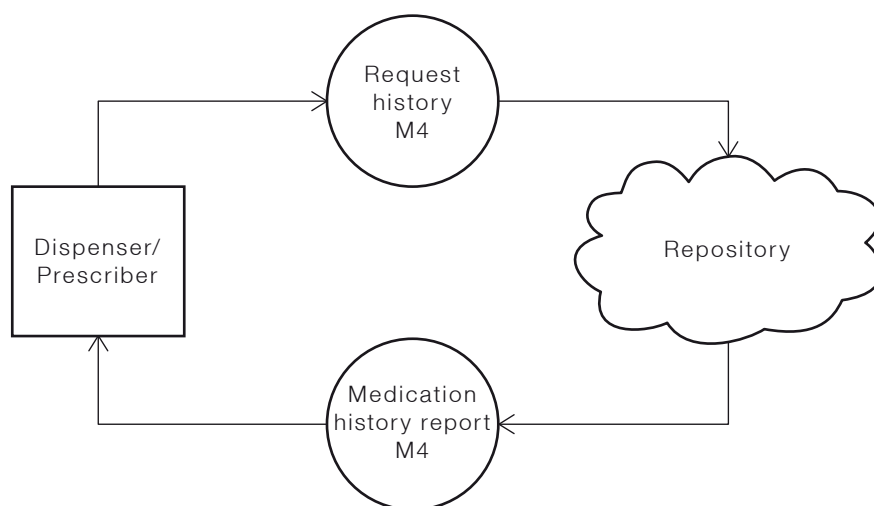


FIGURE 4 MEDICATION HISTORY FUNCTION

5.2.2.5 Medication review function

The medication review function diagram (see Figure 5) shows the overall process of requesting medication review for a patient or patients. The process commences with the dispenser/prescriber requesting a review of a patient history from an authorized reviewer and then shows the review report returned to the dispenser/prescriber.

The details required to be sent in a medication review are adequately covered by the Referral Message REF^I12 in AS 4700.6.

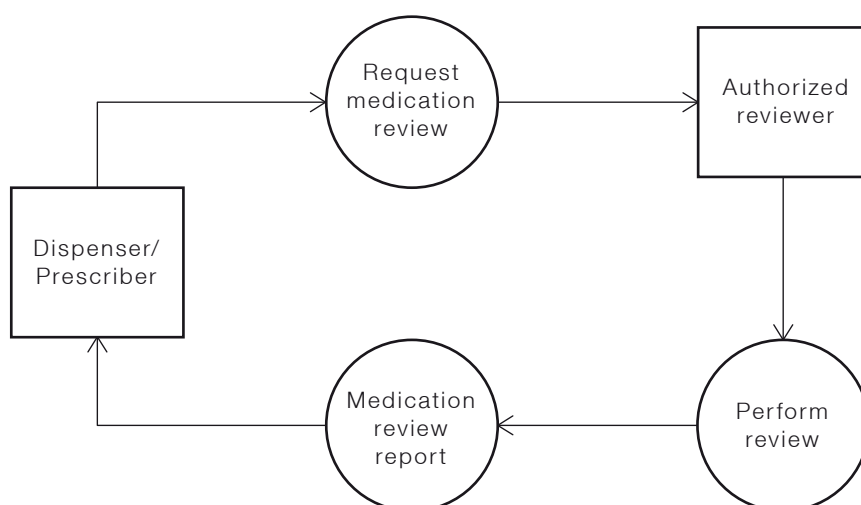


FIGURE 5 MEDICATION REVIEW FUNCTION

5.2.2.6 Reporting function

The reporting function diagram (see Figure 6) shows the overall process of querying a medicines information source or notifying a repository of a possible event. The process shows the dispenser/prescriber sending a query or notification of a possible event.

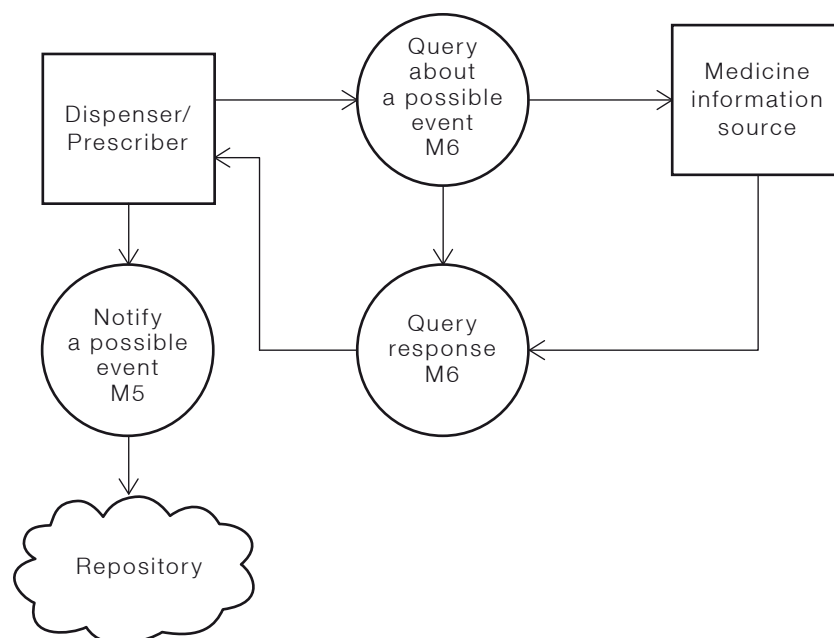


FIGURE 6 REPORTING FUNCTION

5.2.3 Message interaction diagrams

5.2.3.1 M1—Medication Order messaging

When a medication order/clarification/approval is sent from a prescriber/dispenser/approver to a dispenser/prescriber/approver, the HL7 message used is OMP^O09. The dispenser/prescriber/approver sends an ORP^O10 acknowledgement message to signify that the order has been stored and processed. See Figure 7.

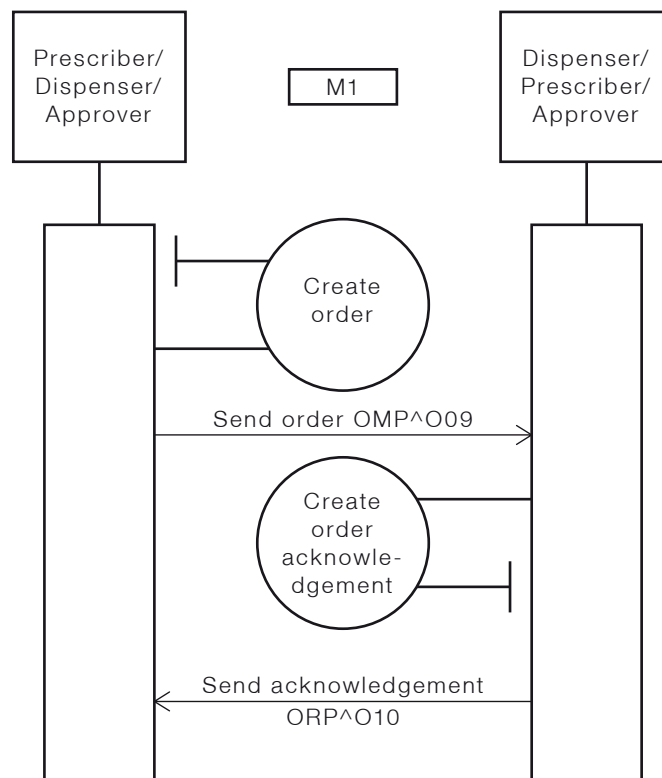


FIGURE 7 M1—MEDICATION ORDER MESSAGING

*Order Control Codes**OMP Codes*

- Prescriber places new Medication Order (Control Code: NW)
Refer to Prescribing (Clause 5.2.2.1) for further detail on functionality.
- Dispensing request change of Order (Control Code: XO)
Refer to Dispensing (Clause 5.2.2.2.) for further detail on functionality.
- Prescriber resends Order and either of the following messages:
 - Change as requested (CC = XR)
 - Unable to change (CC = UX)

Refer to Dispensing (Clause 5.2.2.2) for further detail on functionality.

For further Order Control Codes, see HL7 V2.5, Section 4.23.1, HL7 Table 0119—Order Control Code.

NOTE: When this message is used for approval purposes, the specific data items of the message are confirmed with the approver.

5.2.3.2 M2—Dispensing notification messaging

When a dispensing notification record is sent from a dispenser to any system, the HL7 message used is RDS^O13. The system sends an RRD^O14 acknowledgement message to signify that the order has been stored and processed. See Figure 8.

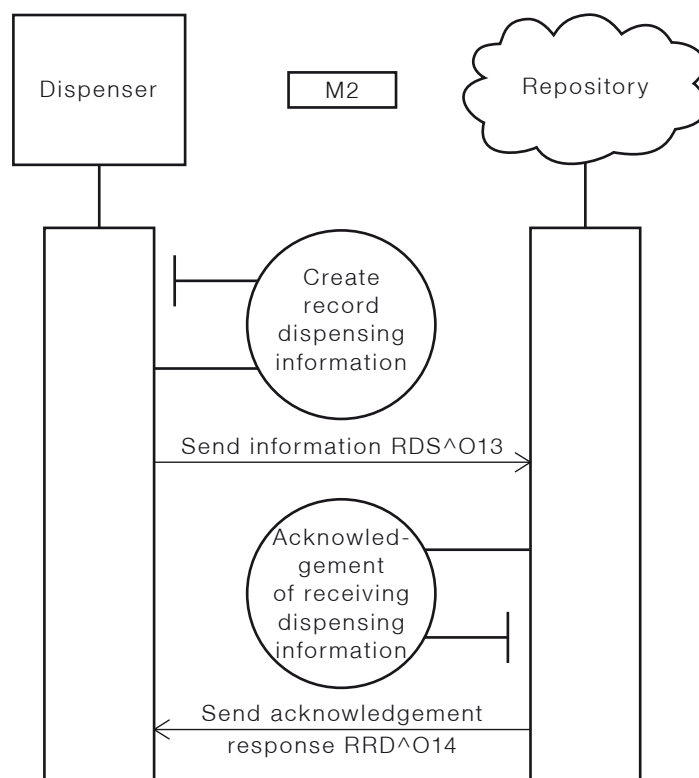


FIGURE 8 M2—DISPENSING NOTIFICATION MESSAGING

Order Control Codes

OMP Codes

- Prescriber places new Medication Order (Control Code: NW)

Refer to Prescribing (Clause 5.2.2.1) for further detail on functionality.

5.2.3.3 M3—Encoded Order messaging

When encoded order information is sent from a dispenser to a prescriber, the HL7 message used is RDE^O11. The prescriber sends an RRE^O12 acknowledgement message to signify that the order has been stored and processed. See Figure 9.

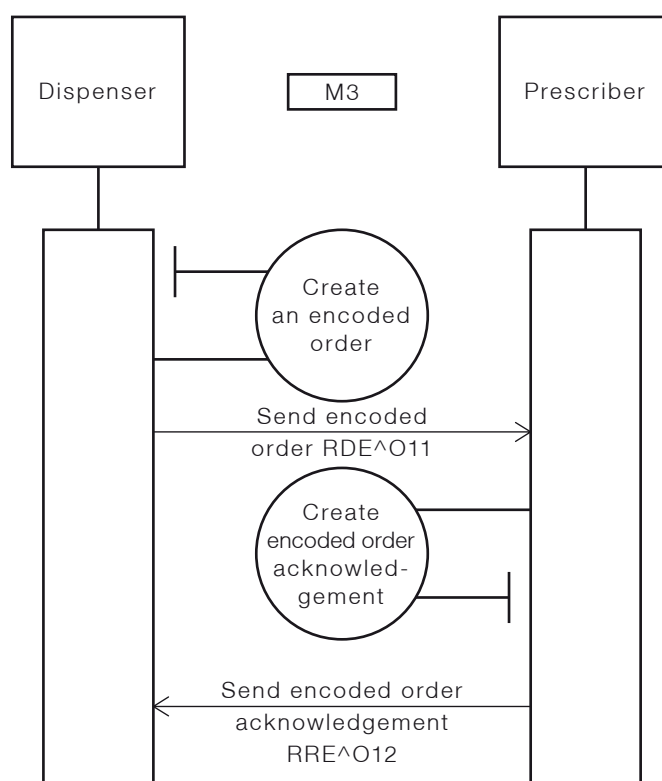


FIGURE 9 M3—ENCODED ORDER MESSAGING

Order Control Codes

OMP Codes

- Prescriber places new Medication Order (Control Code: NW)

Refer to Prescribing (Clause 5.2.2.1) for further detail on functionality.

5.2.3.4 M4—Send enquiry

When an enquiry is sent from a dispenser/prescriber to a repository, the HL7 message used is QBP^Q31. The repository sends an RSP^K31 message with the required information. See Figure 10.

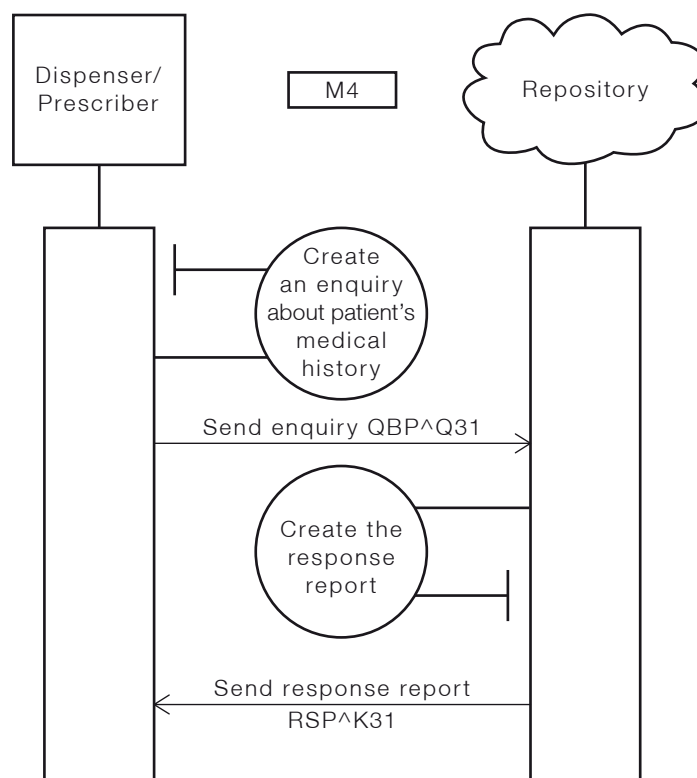


FIGURE 10 M4—SEND ENQUIRY

*Order Control Codes**OMP Codes*

- Prescriber places new Medication Order (Control Code: NW)

Refer to Prescribing (Clause 5.2.2.1) for further detail on functionality.

5.2.3.5 M5—Medication Reaction Reporting messaging

A dispenser/prescriber may wish to send a notification to a repository source of a potential product problem. To do this the HL7 message used is PEX^P07. The repository will send an ACK acknowledgement message to inform the sender that the message was received. See Figure 11.

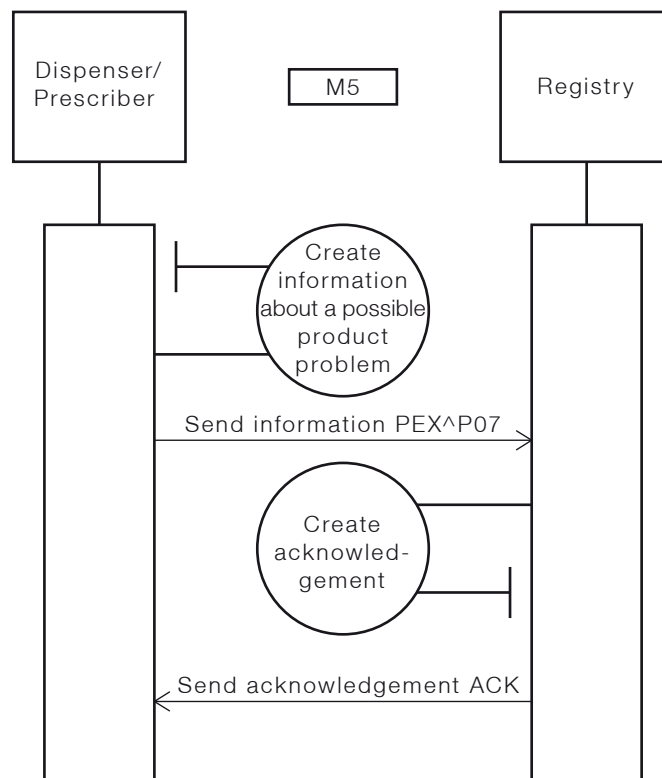


FIGURE 11 M5—MEDICATION REACTION REPORTING MESSAGING

Order Control Codes

OMP Codes

- Prescriber places new Medication Order (Control Code: NW)

Refer to Prescribing (Clause 5.2.2.1) for further detail on functionality.

5.2.3.6 M6—Possible Medication Reaction Query messaging

The dispenser/prescriber might also enquire of the regulator/medicine information source if there is any information on a product problem. In this case the QBP^Z01 message is used. The regulator/medicine information source will return the required information using an RDY^Z01 message. See Figure 12.

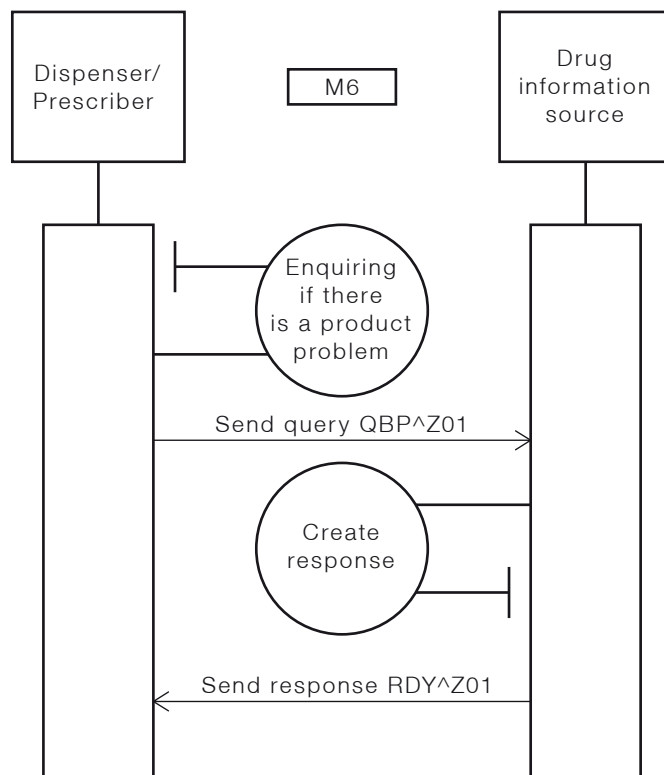


FIGURE 12 M6—POSSIBLE MEDICATION REACTION QUERY MESSAGING

Order Control Codes

OMP Codes

- Prescriber places new Medication Order (Control Code: NW)

Refer to Prescribing (Clause 5.2.2.1) for further detail on functionality.

5.2.3.7 *M7—Administering Medication messaging*

When an order for administering medication is sent from a prescriber to a dose administrant the HL7 message used is RGV^O15. The dose administrant sends an RRG^O16 acknowledgement message to signify that the order has been stored and processed. See Figure 13.

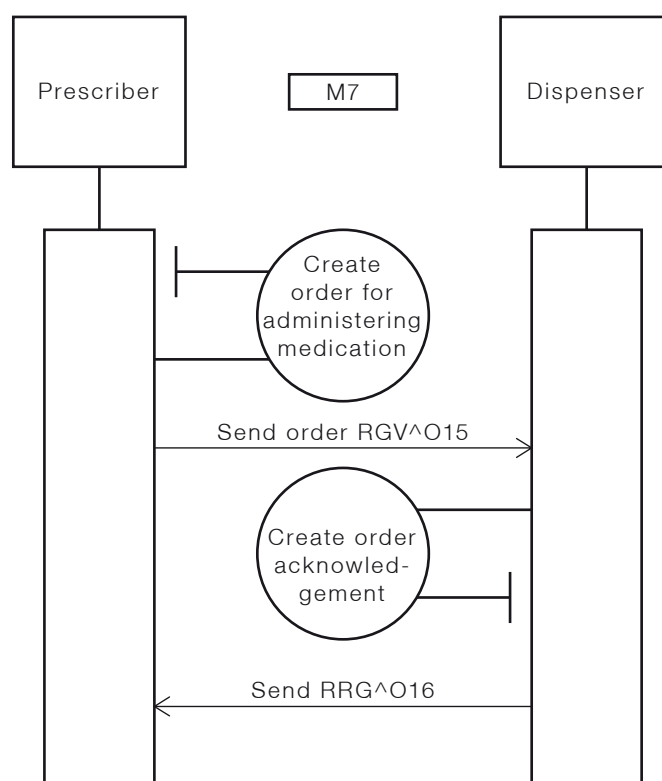


FIGURE 13 M7—ADMINISTERING MEDICATION MESSAGING

Order Control Codes

OMP Codes

- Prescriber places new Medication Order (Control Code: NW)

Refer to Prescribing (Clause 5.2.2.1) for further detail on functionality.

5.2.3.8 M8—Notification of Medication Administering messaging

When a notification that a dose has been administered has been sent by a dose administrant, the HL7 message used is RAS^O17. The system sends an RRA^O18 acknowledgement message to signify that the notification has been stored and processed. See Figure 14.

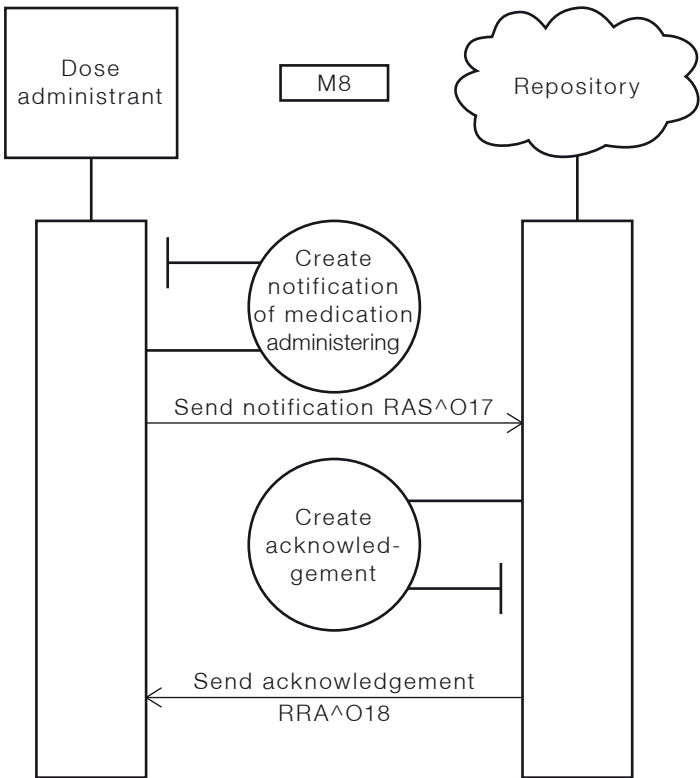


FIGURE 14 M8—NOTIFICATION OF MEDICATION ADMINISTERING MESSAGING

Order Control Codes

OMP Codes

- Prescriber places new Medication Order (Control Code: NW)
Refer to Prescribing (Clause 5.2.2.1) for further detail on functionality.

6 MESSAGES

6.1 Message structural overview

Figure 15 is an overview of the representation of an HL7 message. An arrowed line above a segment indicates that it may be repeated. An arrowed line below a segment indicates that the segment is optional.

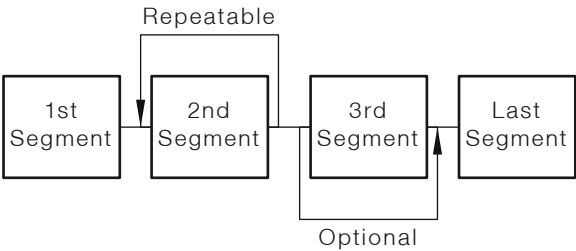


FIGURE 15 MESSAGE STRUCTURAL OVERVIEW

Only those segments that have been identified as relevant have been included in this Standard. Refer to HL7 V2.5 protocol for all other message segments. Also refer to AS 4700.1 for patient-related segments.