

Table of Contents

Chapter 1 - INTRODUCTION

1.1	PURPOSE	1-1
1.2	BACKGROUND	1-2
1.3	NEED FOR A STANDARD	1-3
1.4	GOALS OF THE STANDARD	1-4
1.5	HISTORY OF HL7 DEVELOPMENT	1-5
1.6	OVERVIEW	1-7
1.6.1	HL7 encoding rules	1-7
1.6.2	Local variations	1-7
1.6.3	Evolutionary changes to the standards	1-8
1.6.4	Applicability to file transfers (batch processing)	1-8
1.6.5	Relationship to other protocols	1-8
1.7	REFERENCE DOCUMENTS	1-10
1.7.1	ANSI standards	1-11
1.7.2	ISO standards	1-11
1.7.3	Codes and terminology sources	1-11
1.7.4	Other Applicable Documents	1-12
1.8	SUGGESTIONS AND COMMENTS	1-13

Chapter 2 - CONTROL/QUERY

2.1	INTRODUCTION	2-1
2.2	CONCEPTUAL APPROACH	2-1
2.2.1	Trigger events	2-1
2.2.2	Acknowledgements: original mode	2-2
2.2.3	Acknowledgements: enhanced mode	2-3
2.2.4	Queries	2-3
2.3	COMMUNICATIONS ENVIRONMENT	2-3
2.4	HL7 MESSAGES	2-4

2.4.1	Message definition	2-4
2.4.2	Segments	2-5
2.4.3	Fields	2-5
2.4.4	Message delimiters	2-7
2.4.5	Data types	2-7
2.4.6	Use of escape sequences in text fields	2-19
2.4.7	Message construction rules	2-21
2.4.8	Chapter formats for defining HL7 messages	2-23
2.5	APPLICATION (LEVEL 7) PROCESSING RULES	2-25
2.5.1	Original and enhanced processing rules	2-25
2.5.2	Application (level 7) processing rules, deferred processing	2-32
2.6	ACKNOWLEDGEMENT MESSAGES	2-35
2.6.1	ACK: general acknowledgement	2-35
2.6.2	MCF: Delayed acknowledgement	2-35
2.7	DISPLAY MESSAGES	2-35
2.7.1	Display vs. record-oriented messages	2-35
2.7.2	Unsolicited display update message (trigger event Q05)	2-36
2.7.3	Continuation of unsolicited display update message	2-36
2.8	QUERIES	2-37
2.8.1	Display vs. record-oriented queries	2-37
2.8.2	Message definition	2-37
2.8.3	Immediate vs. deferred response	2-38
2.8.4	Interactive continuation of display messages	2-38
2.8.5	Logical display break points	2-39
2.8.6	Query trigger events and message definitions	2-39
2.8.7	Query message implementation considerations	2-41
2.9	SPECIAL HL7 PROTOCOLS	2-41
2.9.1	Sequence number protocol	2-41
2.9.2	Continuation messages and segments	2-43
2.9.3	HL7 batch protocol	2-44
2.10	MESSAGE CONTROL SEGMENTS	2-47
2.10.1	MSH - message header segment	2-47
2.10.2	MSA - message acknowledgement segment	2-51
2.10.3	ERR - error segment	2-52
2.10.4	QRD - query definition segment	2-53
2.10.5	QRF - query filter segment	2-56
2.10.6	URD - results/update definition segment	2-58
2.10.7	URS - unsolicited selection segment	2-59
2.10.8	DSC - Continuation pointer segment	2-60
2.10.9	DSP - display data segment	2-60
2.10.10	ADD - addendum segment	2-61
2.10.11	FHS - file header segment	2-62
2.10.12	FTS - file trailer segment	2-63
2.10.13	BHS - batch header	2-64
2.10.14	BTS - batch trailer segment	2-65

Table of Contents

2.10.15	NTE - notes and comments segment	2-66
2.10.16	Miscellaneous HL7 tables used across all chapters.	2-67
2.11	SAMPLE CONTROL AND QUERY MESSAGES	2-67
2.11.1	General Acknowledgement	2-67
2.11.2	Error return	2-67
2.11.3	Sequence number: initial message	2-67
2.11.4	Query with display-oriented response	2-68
2.11.5	Master file update examples	2-69
2.12	OUTSTANDING ISSUES	2-70

Chapter 3 - ADMISSION, DISCHARGE, AND TRANSFER

3.1	PURPOSE	3-1
3.2	TRIGGER EVENTS AND MESSAGE DEFINITIONS	3-1
3.2.1	Admit a patient (event code A01)	3-2
3.2.2	Transfer a patient (event code A02)	3-2
3.2.3	Discharge a patient (event code A03)	3-3
3.2.4	Register a patient (event code A04)	3-3
3.2.5	Pre-admit a patient (event code A05)	3-4
3.2.6	Transfer an outpatient to inpatient (event code A06)	3-4
3.2.7	Transfer an inpatient to outpatient (event code A07)	3-5
3.2.8	Update patient information (event code A08)	3-6
3.2.9	Patient departing (event code A09)	3-6
3.2.10	Patient arriving (event code A10)	3-7
3.2.11	Cancel admit (event code A11)	3-7
3.2.12	Cancel transfer (event code A12)	3-7
3.2.13	Cancel discharge (event code A13)	3-8
3.2.14	Pending admit (event code A14)	3-8
3.2.15	Pending transfer (event code A15)	3-9
3.2.16	Pending discharge (event code A16)	3-9
3.2.17	Swap patients (event code A17)	3-10
3.2.18	Merge patient information (event code A18)	3-10
3.2.19	Patient query (event code A19)	3-11
3.2.20	Bed status update (event code A20)	3-12
3.2.21	Patient goes on a "leave of absence" (event code A21)	3-12
3.2.22	Patient returns from a "leave of absence" (event code A22)	3-13
3.2.23	Delete a patient record (event code A23)	3-13
3.2.24	Link patient information (event code A24)	3-13
3.2.25	Cancel pending discharge (event code A25)	3-14
3.2.26	Cancel pending transfer (event code A26)	3-14
3.2.27	Cancel pending admit (event code A27)	3-14
3.2.28	Add person information (event code A28)	3-15
3.2.29	Delete person information (event code A29)	3-16
3.2.30	Merge person information (event code A30)	3-16
3.2.31	Update person information (event code A31)	3-17
3.2.32	Cancel patient arriving (event code A32)	3-17
3.2.33	Cancel patient departing (event code A33)	3-17

3.2.34	Merge patient information - patient ID only (event code A34)	3-18
3.2.35	Merge patient information - account number only (event code A35)	3-18
3.2.36	Merge patient information - patient ID & account number	3-18
3.2.37	Un-link patient information (event code A37)	3-19
3.3	MESSAGE SEGMENTS	3-19
3.3.1	EVN - Event type	3-19
3.3.2	PID - Patient Identification	3-21
3.3.3	PV1 - Patient visit	3-26
3.3.4	PV2 - Patient visit - additional information	3-35
3.3.5	NK1 - Next of kin	3-36
3.3.6	AL1 - Patient allergy information	3-38
3.3.7	NPU - Bed status update	3-40
3.3.8	MRG - Merge patient information	3-40
3.4	EXAMPLE TRANSACTIONS	3-41
3.4.1	Admit a patient - trigger event A01 (basic example)	3-41
3.4.2	Merge patient information - trigger event A18 (basic example)	3-42
3.4.3	Admit a patient - trigger event A01 (complex example)	3-42
3.5	IMPLEMENTATION CONSIDERATIONS	3-42
3.5.1	Swapping a patient	3-42
3.5.2	Merging patient/person information	3-43
3.5.3	Patient record links	3-43
3.6	OUTSTANDING ISSUES	3-43

Chapter 4 - ORDER ENTRY

4.1	OVERVIEW	4-1
4.1.1	Preface (organization of this chapter)	4-1
4.1.2	Glossary	4-2
4.2	ORDER MESSAGE DEFINITIONS	4-3
4.2.1	ORM - general order message	4-3
4.2.2	ORR - general order response message (response to any ORM)	4-4
4.3	SEGMENTS COMMON TO ALL ORDERS	4-5
4.3.1	ORC - common order segment	4-5
4.3.2	BLG - Billing Segment	4-20
4.4	QUANTITY/TIMING (TQ) DEFINITION	4-21
4.4.1	Quantity component (CQ)	4-21
4.4.2	Interval component (CM)	4-22
4.4.3	Duration component	4-23
4.4.4	Start date/time component (TS)	4-23
4.4.5	End date/time component (TS)	4-23
4.4.6	Priority component (ID)	4-24
4.4.7	Condition component (ST)	4-24

Table of Contents

4.4.8	Text component (TX)	4-24
4.4.9	Conjunction component (ID)	4-24
4.4.10	Order sequencing component (complex)	4-25
4.5	OBSERVATION AND DIAGNOSTIC STUDY ORDERS	4-28
4.5.1	OBR - observation request segment	4-28
4.5.2	Examples of use	4-38
4.6	DIET ORDERS	4-40
4.6.1	ODS - dietary orders, supplements, and preferences	4-42
4.6.2	ODT - diet tray instructions segment	4-43
4.6.3	Example diet messages	4-44
4.7	SUPPLY ORDERS	4-46
4.7.1	RQD - requisition detail	4-48
4.7.2	RQ1 - requisition detail-1 segment	4-50
4.7.3	Examples of the use of RQD and RQ1 segments	4-51
4.8	PHARMACY ORDERS	4-53
4.8.1	ORM - pharmacy prescription message	4-53
4.8.2	RXO - pharmacy prescription order segment	4-53
4.8.3	RXR - pharmacy route segment	4-58
4.8.3	RXC - Pharmacy component order segment	4-60
4.8.5	IV solution groups	4-61
4.8.6	RDE message: pharmacy encoded order	4-61
4.8.7	RXE - Pharmacy encoded order segment	4-62
4.8.9	RDS - Pharmacy dispense message	4-68
4.8.10	RXD - Pharmacy dispense segment	4-69
4.8.11	RGV - pharmacy give message	4-71
4.8.12	RXG - pharmacy give segment	4-73
4.8.13	RAS - pharmacy administration message	4-76
4.8.14	RXA - pharmacy administration segment	4-78
4.8.15	Pharmacy queries	4-79
4.8.16	Examples of use	4-80
4.9	OUTSTANDING ISSUES	4-87
APPENDIX 4.A	HL7 PHARMACY ORDERS AND RESULTS	4-88
4.A.1	Pharmacy orders and results transaction flow diagram	4-88

Chapter 5 - QUERY

5-1

Chapter 6 - FINANCE

6.1	PURPOSE	6-1
6.2	PATIENT ACCOUNTING MESSAGE SET	6-1
6.3	TRIGGER EVENTS AND MESSAGE DEFINITIONS	6-1
6.3.1	Add and update patient accounts (event code P01)	6-2
6.3.2	Purge patient accounts (event code P02)	6-2
6.3.3	Post detail financial transactions (event code P03)	6-3
6.3.4	Generate bills and accounts receivable statements (event code P04)	6-3
6.4	MESSAGE SEGMENTS	6-4
6.4.1	FT1 - financial transaction	6-4
6.4.2	DG1 - Diagnosis	6-7
6.4.3	PR1 - Procedures	6-9
6.4.4	GT1 - guarantor	6-12
6.4.5	IN1 - insurance	6-15
6.4.6	IN2 - insurance additional info	6-21
6.4.7	IN3 - insurance additional info - certification	6-26
6.4.8	ACC - accident	6-30
6.4.9	UB1 - UB82 data	6-31
6.4.10	UB2 - UB92 data	6-34
6.5	EXAMPLE TRANSACTIONS	6-36
6.5.1	Create a patient billing/accounts receivable record	6-36
6.5.2	UB82 information updated from utilization review department	6-36
6.5.3	Diagnosis and DRG assignment	6-37
6.6	IMPLEMENTATION CONSIDERATIONS	6-37
6.7	OUTSTANDING ISSUES	6-37

Chapter 7 - OBSERVATION REPORTING

7.1	INTRODUCTION AND OVERVIEW	7-1
7.1.1	Glossary	7-3
7.1.2	Narrative reports as batteries with many OBX results	7-4
7.1.3	Suffixes for defining observation IDs	7-5
7.1.4	Identifying reporting units	7-9
7.2	MESSAGE DEFINITIONS	7-14
7.2.1	ORU - unsolicited transmission of an observation	7-14
7.2.2	Query for results of observation	7-15
7.3	SEGMENTS	7-15
7.3.1	OBR - Observation request	7-16
7.3.2	OBX - Observation/Result segment	7-17

Table of Contents

7.4	EXAMPLE TRANSACTIONS	7-25
7.4.1	Query/response	7-25
7.4.2	Unsolicited	7-26
7.4.3	Example message (from ASTM 1238-91)	7-27
7.4.4	Example of narrative report messages (from ASTM 1238-91)	7-28
7.4.5	Reporting cultures and sensitivities	7-30
7.4.6	Results reporting	7-33
7.4.7	Patient-specific clinical data with an order	7-34
7.5	OUTSTANDING ISSUES	7-34
	APPENDIX 7.A (Informative) Universal (AS4) Identifiers for Common Test Battery	7-35
7.A.1	Components That Do Not Have Uniquely Defined CPT-4 Codes	7-35
	APPENDIX 7.B (Normative) TEST/OBSERVATION MASTER SEGMENTS (OMx)	7-57
7.B.1	General Approach	7-57
7.B.2	Message Structure	7-58
7.B.3	OM1 - General Segment (Fields That Apply to Most Observations)	7-58
7.B.4	OM2 - Numeric Observation Segment	7-68
7.B.5	OM3 - Categorical Test/Observation Segment	7-73
7.B.6	OM4 - Observations That Require Specimens	7-74
7.B.7	OM5 - Observation Batteries (Sets)	7-77
7.B.8	OM6 - Observations That Are Calculated from Other Observations	7-78

Chapter 8 - MASTER FILES

8.1	PURPOSE	8-1
8.2	TRIGGER EVENTS	8-2
8.3	MESSAGES	8-3
8.3.1	MFN - master files notification	8-3
8.3.2	MFD - master files delayed application acknowledgement	8-4
8.3.3	MFQ - master files query	8-5
8.4	SEGMENT DEFINITIONS	8-5
8.4.1	MFI - master file identification segment	8-5
8.4.2	MFE - master file entry segment	8-7
8.4.3	MFA - master file acknowledgement segment	8-9
8.5	EXAMPLES	8-10
8.5.1	ZL7 segment (proposed example only)	8-10
8.5.2	MFN message with original acknowledgement mode	8-11
8.5.3	Enhanced mode application level acknowledgement to the MFN message	8-11
8.5.4	Delayed application level acknowledgement	8-12
8.6	OUTSTANDING ISSUES	8-12

8.APPENDIX A:		8-13
8.A.1	STF - staff identification segment	8-13
8.A.2	PRA - practitioner detail segment	8-17
8.A.3	Example: Doctor Master File MFN message	8-18

Appendix A - DATA DEFINITION TABLES

A-1

Appendix B - LOWER LAYER PROTOCOL

B-1

Moved to HL7 Implementation Guide

Appendix C - NETWORK MANAGEMENT

C.1	TRIGGER EVENTS AND MESSAGE DEFINITIONS	C-1
C.1.1	NMQ - Network management query	C-1
C.1.2	NMD - Network management data	C-2
C.2	NETWORK MANAGEMENT MESSAGE SEGMENTS	C-3
C.2.1	NCK - system clock	C-3
C.2.2	NST - statistics	C-4
C.2.3	NSC - status change	C-6
C.2.4	QRD - query definition	C-7

Appendix D - BNF MESSAGE DESCRIPTIONS

D.1	BNF Descriptions of HL7 version 2.2 Abstract Messages	D-1
D.1.1	Overview	D-1
D.1.2	Tokens	D-1
D.1.3	BNF Message Definitions	D-2

Appendix E - GLOSSARY

E-1

Index