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1. MSH segment structure

-. This segment is the HL7 MSH message segment, indicating the Message Header.

-. Segment Field

- MSH-1: Field Separator (ST)
- MSH-2: Encoding Characters (ST)
- MSH-3: Sending Application (HD) optional
- MSH-4: Sending Facility (HD) optional
- MSH-5: Receiving Application (HD) optional
- MSH-6: Receiving Facility (HD) optional
- MSH-7: Date/Time of Message (DTM)
- MSH-8: Security (ST) optional
- MSH-9: Message Type (MSG)
- MSH-10: Message Control ID (ST)
- MSH-11: Processing ID (PT)
- MSH-12: Version ID (VID)
- MSH-13: Sequence Number (NM) optional
- MSH-14: Continuation Pointer (ST) optional
- MSH-15: Accept Acknowledgment Type (ID) optional
- MSH-16: Application Acknowledgment Type (ID) optional
- MSH-17: Country Code (ID) optional
- MSH-18: Character Set (ID) optional repeating
- MSH-19: Principal Language Of Message (CWE) optional
- MSH-20: Alternate Character Set Handling Scheme (ID) optional
- MSH-21: Message Profile Identifier (EI) optional repeating
- MSH-22: Sending Responsible Organization (XON) optional
- MSH-23: Receiving Responsible Organization (XON) optional
- MSH-24: Sending Network Address (HD) optional
- MSH-25: Receiving Network Address (HD) optional

2. PID segment structure

-. This segment is the HL7 PID segment, indicating the Patient Identification

-. Segment Field

- PID-1: Set ID - PID (SI) optional
- PID-2: Patient ID (CX) optional
- PID-3: Patient Identifier List (CX) repeating
- PID-4: Alternate Patient ID - PID (CX) optional repeating
- PID-5: Patient Name (XPN) repeating
- PID-6: Mother's Maiden Name (XPN) optional repeating
- PID-7: Date/Time of Birth (DTM) optional
- PID-8: Administrative Sex (IS) optional
- PID-9: Patient Alias (XPN) optional repeating
- PID-10: Race (CWE) optional repeating

3. OBR segment structure

-. This segment is the HL7 OBR message segment, indicating the Observation Request

-. Segment Field

- OBR-1: Set ID - OBR (SI) optional
- OBR-2: Placer Order Number (EI) optional
- OBR-3: Filler Order Number (EI) optional
- OBR-4: Universal Service Identifier (CWE)
- OBR-5: Priority (ID) optional
- OBR-6: Requested Date/Time (DTM) optional
- OBR-7: Observation Date/Time # (DTM) optional
- OBR-8: Observation End Date/Time # (DTM) optional
- OBR-9: Collection Volume * (CQ) optional
- OBR-10: Collector Identifier * (XCN) optional repeating
- OBR-11: Specimen Action Code * (ID) optional

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- OBR-12: Danger Code (CWE) optional

4. ORC segment structure

-. This segment is the HL7 ORC message segment, indicating the Common Order

-. Segment Field

- ORC-1: Order Control (ID)
- ORC-2: Placer Order Number (EI) optional
- ORC-3: Filler Order Number (EI) optional
- ORC-4: Placer Group Number (EI) optional
- ORC-5: Order Status (ID) optional
- ORC-6: Response Flag (ID) optional
- ORC-7: Quantity/Timing (TQ) optional repeating
- ORC-8: Parent (EIP) optional
- ORC-9: Date/Time of Transaction (DTM) optional
- ORC-10: Entered By (XCN) optional repeating
- ORC-11: Verified By (XCN) optional repeating
- ORC-12: Ordering Provider (XCN) optional repeating
- ORC-13: Enterer's Location (PL) optional
- ORC-14: Call Back Phone Number (XTN) optional repeating
- ORC-15: Order Effective Date/Time (DTM) optional
- ORC-16: Order Control Code Reason (CWE) optional
- ORC-17: Entering Organization (CWE) optional
- ORC-18: Entering Device (CWE) optional
- ORC-19: Action By (XCN) optional repeating

5. SPM segment structure

-. This segment is the HL7 SPM message segment, indicating the specimen

-. Segment Field

- SPM-1: Set ID - SPM (SI) optional
- SPM-2: Specimen ID (EIP) optional
- SPM-3: Specimen Parent IDs (EIP) optional repeating
- SPM-4: Specimen Type (CWE)
- SPM-5: Specimen Type Modifier (CWE) optional repeating
- SPM-6: Specimen Additives (CWE) optional repeating
- SPM-7: Specimen Collection Method (CWE) optional
- SPM-8: Specimen Source Site (CWE) optional
- SPM-9: Specimen Source Site Modifier (CWE) optional repeating
- SPM-10: Specimen Collection Site (CWE) optional
- SPM-11: Specimen Role (CWE) optional repeating
- SPM-12: Specimen Collection Amount (CQ) optional
- SPM-13: Grouped Specimen Count (NM) optional
- SPM-14: Specimen Description (ST) optional repeating
- SPM-15: Specimen Handling Code (CWE) optional repeating
- SPM-16: Specimen Risk Code (CWE) optional repeating
- SPM-17: Specimen Collection Date/Time (DR) optional
- SPM-18: Specimen Received Date/Time (DTM) optional
- SPM-19: Specimen Expiration Date/Time (DTM) optional

6. OBX segment structure

-. This segment is the HL7 OBX message segment, indicating the Observation/Result

-. Segment Field.

- OBX-1: Set ID - OBX (SI) optional
- OBX-2: Value Type (ID) optional
- OBX-3: Observation Identifier (CWE)
- OBX-4: Observation Sub-ID (ST) optional
- OBX-5: Observation Value (Varies) optional repeating

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- OBX-6: Units (CWE) optional
- OBX-7: References Range (ST) optional
- OBX-8: Abnormal Flags (IS) optional repeating
- OBX-9: Probability (NM) optional
- OBX-10: Nature of Abnormal Test (ID) optional repeating
- OBX-11: Observation Result Status (ID)

7. Message example

-. Message formulation from Analyzer to server

-. <SB>: 0x0B

-. <EB>: 0x1C

-. <CR>: 0x0D

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<SB>
MSH|^~\&|Protocol|ModelName|DeviceNum||Date||OUL^R24^OUL_R24|1|T|2.6<CR>
PID||PatientID1|PatientID2|PatientID3|||Age|Gender<CR>
OBR||TestName|TestType|SampleType|||Date|||UserID<CR>
ORC|OK|||||||||DeviceNum|SlotNum<CR>
SPM|1|CartridgeLotName|||||||||CartridgeExpiryDate<CR>
SPM|2|ControlLotName|ControlName|||||||||ControlExpiryDate <CR>
OBX|1|TX|Result1TestName||Result1Value|Unit1|Result1Flag|Result1Type||R<CR>
OBX|2|TX|Result2TestName||Result2Value|Unit2|Result2Flag|Result2Type||R<CR>
OBX|3|TX|Result3TestName||Result3Value|Unit3|Result3Flag|Result3Type||R<CR>
OBX|4|TX|Result4TestName||Result4Value|Unit4|Result4Flag|Result4Type||R<CR>
OBX|5|TX|Result5TestName||Result5Value|Unit5|Result5Flag|Result5Type||R<CR>
<EB><CR>

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-. The meaning of segment

Segment example	Each parameter segment meaning
<SB>	Start Block character
MSH ^~\& Protocol ModelName DeviceNum Date OUL^R24^OUL_R24 1 T 2.6<CR>	Message header
PID PatientID1 PatientID2 PatientID3 Age Gender<CR>	Patient information
OBR TestName TestType SampleType Date UserID<CR>	Test information
ORC OK DeviceNum SlotNum<CR>	Device information
SPM 1 CartridgeLotName CartridgeExpiryDate<CR>	Cartridge information
SPM 2 ControlLotName ControlName ControlExpiryDate <CR>	Control information
OBX 1 TX Result1TestName Result1Value Unit1 Result1Flag Result1Type R<CR>	Test result 1
OBX 2 TX Result2TestName Result2Value Unit2 Result2Flag Result2Type R<CR>	Test result 2
OBX 3 TX Result3TestName Result3Value Unit3 Result3Flag Result3Type R<CR>	Test result 3
OBX 4 TX Result4TestName Result4Value Unit4 Result4Flag Result4Type R<CR>	Test result 4
OBX 5 TX Result5TestName Result5Value Unit5 Result5Flag Result5Type R<CR>	Test result 5
<EB><CR>	End Block character, Carriage return

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-. each segment location of the results in HL7 field

Number	Parameter	Description	Valid value	Segment location
1	Protocol	Protocol version	Digit	MSH-3
2	ModelName	Device model name	alphanumeric	MSH-4
3	DeviceNum	Device serial number	alphanumeric	MSH-5, ORC-18
4	Date	Test date (YYYYMMDDHHMMSS)	alphanumeric	MSH-7, OBR-7
5	UserID	Operator ID	alphanumeric	OBR-10
6	Patient ID1	User input Patient ID	alphanumeric	PID-2
7	Patient ID2	Specimen barcode ID	alphanumeric	PID-3
8	Patient ID3	Default Patient ID	alphanumeric	PID-4
9	Age	Patient age	Digit	PID-7
10	Gender	Patient gender	Male / Female	PID-8
11	TestName	Test name Ex) CRP, PCT	alphanumeric	OBR-2
12	TestType	0: General mode 1: QC mode 2: QC calibration mode	Digit	OBR-3
13	SampleType	0: Whole blood 1: Serum/Plasma 2: Urine 3: Feces 4: Swab 5: Etc	Digit	OBR-4
14	CartridgeLotName	Test cartridge lot name	alphanumeric	1 st SPM-2
15	CartridgeExpiry Date	Test cartridge expiry date (YYYYMMDD)	alphanumeric	1 st SPM-19
16	ControlLotName	Control lot name	alphanumeric	2 nd SPM-2
17	ControlName	Control name	alphanumeric	2 nd SPM-4
18	ControlExpiryDate	Control expiry date (YYYYMM)	alphanumeric	2 nd SPM-19
19	Result1TestName	Test name of result 1 Ex) CRP, PCT	alphanumeric	1 st OBX-3
20	Result2TestName	Test name of result 2 Ex) CRP, PCT	alphanumeric	2 nd OBX-3
21	Result3TestName	Test name of result 3 Ex) CRP, PCT	alphanumeric	3 rd OBX-3

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22	Result4TestName	Test name of result 4 Ex) CRP, PCT	alphanumeric	4 th OBX-3
23	Result5TestName	Test name of result 5 Ex) CRP, PCT	alphanumeric	5 th OBX-3
24	Result1Value	Quantitative result of Result 1	alphanumeric	1 st OBX-5
25	Result1Flag	Qualitative result of Result 1 0: Positive 1: Negative 2: Indeterminate	Digit	1 st OBX-7
26	Result1Type	Result type of Result 1 0: Quantitative 1: Qualitative 2: Semi quantitative	Digit	1 st OBX-8
27	Result2Value	Quantitative result of Result 2	alphanumeric	2 nd OBX-5
28	Result2Flag	Qualitative result of Result 2 0: Positive 1: Negative 2: Indeterminate	Digit	2 nd OBX-7
29	Result2Type	Result type of Result 2 0: Quantitative 1: Qualitative 2: Semi quantitative	Digit	2 nd OBX-8
30	Result3Value	Quantitative result of Result 3	alphanumeric	3 rd OBX-5
31	Result3Flag	Qualitative result of Result 3 0: Positive 1: Negative 2: Indeterminate	Digit	3 rd OBX-7
32	Result3Type	Result type of Result 3 0: Quantitative 1: Qualitative 2: Semi quantitative	Digit	3 rd OBX-8
33	Result4Value	Quantitative result of Result 4	alphanumeric	4 th OBX-5
34	Result4Flag	Qualitative result of Result 4 0: Positive 1: Negative 2: Indeterminate	Digit	4 th OBX-7
35	Result4Type	Result type of Result 4 0: Quantitative 1: Qualitative 2: Semi quantitative	Digit	4 th OBX-8
36	Result5Value	Quantitative result of Result 5	alphanumeric	5 th OBX-5
37	Result5Flag	Qualitative result of Result 5 0: Positive 1: Negative 2: Indeterminate	Digit	5 th OBX-7
38	Result5Type	Result type of Result 5 0: Quantitative 1: Qualitative 2: Semi quantitative	Digit	5 th OBX-8

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39	Unit1	Unit of result 1	alphanumeric	1 st OBX-6
40	Unit2	Unit of result 2	alphanumeric	2 nd OBX-6
41	Unit3	Unit of result 3	alphanumeric	3 rd OBX-6
42	Unit4	Unit of result 4	alphanumeric	4 th OBX-6
43	Unit5	Unit of result 5	alphanumeric	5 th OBX-6
44	SlotNum	Device slot number	alphanumeric	ORC-19

- . Message formulation from Server to analyzer (Only 3 byte)
- . <SB>: 0x0B
- . <EB>: 0x1C
- . <CR>: 0x0D

- E.O.D -