



## Fundamentals Course

### Z – Segments

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In this unit, you will learn about extending the standard using Z elements.

## Z ELEMENTS

### Overview

HL7 is a standard developed primarily for the exchange of healthcare information. In the process of developing HL7 standards -- defining the events that necessitate information exchange and the information content of the message in the exchange -- every effort is made to take into account all the needs presented by the various interested members of HL7.

Despite this, and for any number of reasons, during implementation we may encounter applications that need **to exchange information that was either not anticipated or not included in the standard**. For these types of site specific exchanges, or local use, HL7 allows fields, segments and messages whose identifiers begin with the letter Z.

This is an important concept to remember:



*HL7 v2.x allows the creation of local fields, segments and messages to exchange information not accommodated by the standard. The names of these local artifacts must begin with Z.*

HL7 V2.x allows us to locally define additional fields, segments, messages, trigger events and escape sequences.

However, it must be understood that Z elements should only be used when a comprehensive analysis of the standard presents no other alternative. Z elements are *not* to be used as replacements of standard elements. Keep in mind that even though the standard allows for the use of Z elements, **Z elements are NOT standard**; their use can only be agreed upon at a local level during implementation. Overuse of local elements can significantly diminish the benefits of creating standard interfaces.



## WHEN TO CREATE A Z ELEMENT

A Z element can be created when an interface needs to carry information not defined in the standard. You should not create either segments or fields to send information already contained in the standard. For example, patient name is already defined in the PID segment and therefore should not be sent as a Z field or part of a Z segment.



*Take the time to do a thorough review of the standard before creating any Z element.*

Points to consider regarding Z elements:

- **Avoid adding HL7 segments to HL7 messages whose standard definition does not include them.**

If an ADT message does not include an ORM segment, it would not be advisable to add that segment to the definition of that ADT message and trigger event. It would be better to define a Z element (message and/or trigger event) that includes the necessary message variant.

- **Use HL7 data types rather than “local” variations**

Keep in mind that parsers tend to reuse functionality. If you define a Z format to send the time and date, then you must send a notification of this change to all the systems that communicate with you, and those systems must be able to understand this new format.

- **Avoid extending preexisting HL7 standard data types or segments.**

Elements added locally to standard HL7 data types or segments can collide with future versions of the standard. Generally when a new requirement arises and is presented to HL7, the responsible Work Group discusses its inclusion in a future version of the standard. Modifications to existing data types or segments are included at the end of the data type or segment in the next published version of the standard. Your local element has now been overlaid by the standard.

For example, suppose that the HIC segment has five fields in version 2.n. As requested by HL7 Australia, HL7 added two more fields to the HIC segment in version 2.(n+1). If, in the meantime, we arbitrarily included in our local version of the HIC segment a field in position six for the inventory number of the printer used



for labeling the bar code of the samples sent to the laboratory. Our HIC segment is going to be non-conformant to the standard when we update to the next HL7 version because almost surely the requirement of Australia is different.



## How to create a Z segment

If you need to create a LOCAL segment, follow these general rules:

1. Limit the Z segment to elements belonging to a single object or entity. Group them logically according to this criterion; for example, family member demographic information, or military healthcare information or information about the hospital census. Use the following parameters as guidelines for developing your definition:
  - Z segment data should correspond to a single element or entity (Example visit, patient, patient account, authorization information)
  - A Z segment may be based on the origin of the data (for instance, being extracted from the same table or file)
2. Where possible, extend existing Z segments rather than creating new ones.
3. Start the segment with an identifier indicating the object that the data pertains to. The segment identifier must begin with the letter Z and, to maintain the standard nomenclature, must have exactly three characters.
4. Document any data that you consider a candidate for inclusion in the standard and present it to the appropriate HL7 Work Group for consideration.

## Maintaining Z segment compatibility

The general rule of maintaining segment compatibility between versions of the HL7 V2.x standard also applies to Z segments.

If you need to add more items to a Z segment they can be added at the end of the segment, with the condition that they be consistent with the criterion that determined which information was included in that segment.

For example, if a Z SEGMENT (ZIN) was defined for additional information about the medical insurance of the patient and an insurer's interface requires additional information, let's say his pet's name, which is not contemplated in the standard, you could add this data (name of insured patient's pet) at the end of the ZIN segment.

This process conforms to the HL7 processing rule of not rejecting a message if it finds fields not expected within a segment (the receiving application is to ignore such fields).



Should a later version of the HL7 standard include the data in the Z segment, the sending system must include this data in both the ZIN segment and in the segment defined in the latest version of the standard. This will ensure compliance with the requirement to maintain backward compatibility between 2.x versions.

The following example illustrates the process.

Suppose that you defined this Z segment for a Version 2.1 implementation:

Table 1 **ZIN (User Insurance Record)**

SEQ	LEN	DT	OPT	RP#	TBL	ELEMENT NAME
1	5	CK				Employer Insurance Code
2	20	CK				Employer Identification Number
3	25	CK				Employer Name
4	2	IS				Employer Information Code
5	5	CK				Ins Payor Id
6	4	CK				Ins Payor SubID
7	1	CK				Ins Eligibility Source

Later, in version 2.3, the HL7 standard incorporates some of the same data in the IN2 segment.

Table 2 **IN2 – insurance additional information** (HL7 Version 2.3)

SEQ	LEN	DT	OPT	RP#	TBL	ELEMENT NAME
...	...	...				...
2	20	CK				Insured's Employee Id
...	...	...				...
4	2	IS				Employer Information Data



Any duplicated fields should be sent in both the ZIN and the IN2 segments.

Later, a new requirement calls for the delivery of more insurance information besides what is defined either by the standard or in our ZIN segment.

We add the new data elements to the end of the ZIN segment.

SEQ	LEN	DT	OPT	RP#	TBL	ELEMENT NAME
1	5	CK				Employer Insurance Code
2	20	CK				Employer Identification Number
3	25	CK				Employer Name
4	2	IS				Employer Information Code
5	5	CK				Ins Payor Id
6	4	CK				Ins Payor SubID
7	1	CK				Ins Eligibility Source
<b>8</b>	<b>1</b>	<b>TX</b>				<b>Gu Ins Rel Cov Code</b>
<b>9</b>	<b>10</b>	<b>TX</b>				<b>GG CNTC Co Phone Number</b>





## How to use Z segments in messages

Z segments can be:

- Added to an existing HL7 message
- Incorporated into a locally defined Z message and/or trigger event

## Where to locate Z segments in an existing message

Keep in mind the following guidelines for incorporating a Z segment in an existing message.

1. It's a good idea to place the segment at the end of the hierarchical tree structure (or segment group) to which it is associated within the message to which it is being added. The following example shows how you might locate Z segments within a message.
2. A Z segment can be repeated and used as many times as necessary within the same message definition, always following the coding rules of HL7.
3. A Z segment can be used in any message that requires it.



## Example of Z-Segment inclusion

SEGMENT ID	SEGMENT DESCRIPTION
MSH	Message Header
{{ SFT }}	Software Segment
EVN	Event Type
PID	Patient Identification
[PD1]	Additional Demographics
{{ROL}}	Role
{{ NK1 }}	Next of Kin/Associated Parties
PV1	Patient Visit
[PV2]	Patient Visit - Additional Info.
{{ROL}}	Role
<b>{{ZVS}}</b>	<b>Z Additional Visit Information</b>
{{ DB1 }}	Disability Information
{{ OBX }}	Observation/Result
{{AL1}}	Allergy Information
{{ DG1 }}	Information diagnosis
[DRG]	Diagnosis Related Group
{{	--- PROCEDURE begin
PR1	Procedures
{{ROL}}	Role
}}	--- PROCEDURE end
{{ GT1 }}	Guarantor
{{	--- INSURANCE begin
IN1	Insurance
[IN2]	Insurance Additional Info.
{{ IN3 }}	Insurance Additional Info - CERT.
{{ROL}}	Role
<b>{{ZIN}}</b>	<b>Z Additional Insurance User Record</b>
}}	--- INSURANCE end
[ACC]	Accident Information
[UB1]	Universal Bill Information
[UB2]	Universal Bill 92 Information
[PDA]	Patient Death and Autopsy



## Creating Z messages and trigger events

If a real-world event needs to be communicated but is not identified in the current standard, you may wish to define a Z message and/or Z trigger event. For example, an application may require information relating to the hospital bed census at the end of the day ("daily census closure").

Z messages and/or trigger events can be composed of standard segments and need not include Z segments.

We know, for example, that all HL7 messages, which includes Z messages, must begin with the MSH segment.

To define the message, we follow the HL7 standard to determine the segments that are to be included, how they are to be grouped, whether they are required or optional, and whether segments and/or groups may repeat.

Example:

### ZDT Z01 – Daily Census Closure

SEGMENT ID	SEGMENT DESCRIPTION
MSH	Message Header
EVN	Event Type
PID	Patient Identification
{{ NK1 }}	Next of Kin/Associated Parties
PV1	Patient Visit
[PV2]	Patient Visit - Additional Info.
{{ OBX }}	Observation/Result
{{ DG1 }}	Information diagnosis
PR1	Procedures
{{ GT1 }}	Guarantor
{{ IN1 }}	Insurance
[IN2]	Insurance Additional Info.
[ IN3]	Insurance Additional Info - CERT.



## Identify Z segment requirements

Remember - the use of Z-segments is strongly discouraged as they are extremely costly to maintain, especially as the application and HL7 advance over time. They should be used *only if there is no alternative*.

Once you have confirmed that some information necessary to the exchange is not included in the standard, define and document Z segments across applications to include these elements.