

# Message Construction Guide for GP Software Vendors: acknowledgement message

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## Version History:

Date	Version	Authors	Reason for change
15/04/2009	0.2	Brian O'Mahony, Gemma Garvan	Initial Draft
02/10/2009	0.3	Martin Krim	Removed reference to referral response ACK message
10/12/2009	0.4	Martin Krim	Added back reference to referral response ACK message
26/01/2011	0.5	Senthil Nathan	XML Sample Changes:  Changed section 6 (Acknowledgement to Healthlink) MSH.5, HD.1 field to 'HEALTHLINKONLINE'.
22/08/2011	0.6	Karen Wynne, Siobhan Hanrahan, Brian O'Mahony	Addendum added on use of the Acknowledgement message for General Referrals.
26/08/2011	0.7	Karen Wynne, Sinead Glennon	Change to the description of Healthlink validation in the first paragraph of Section 4 of the Addendum.

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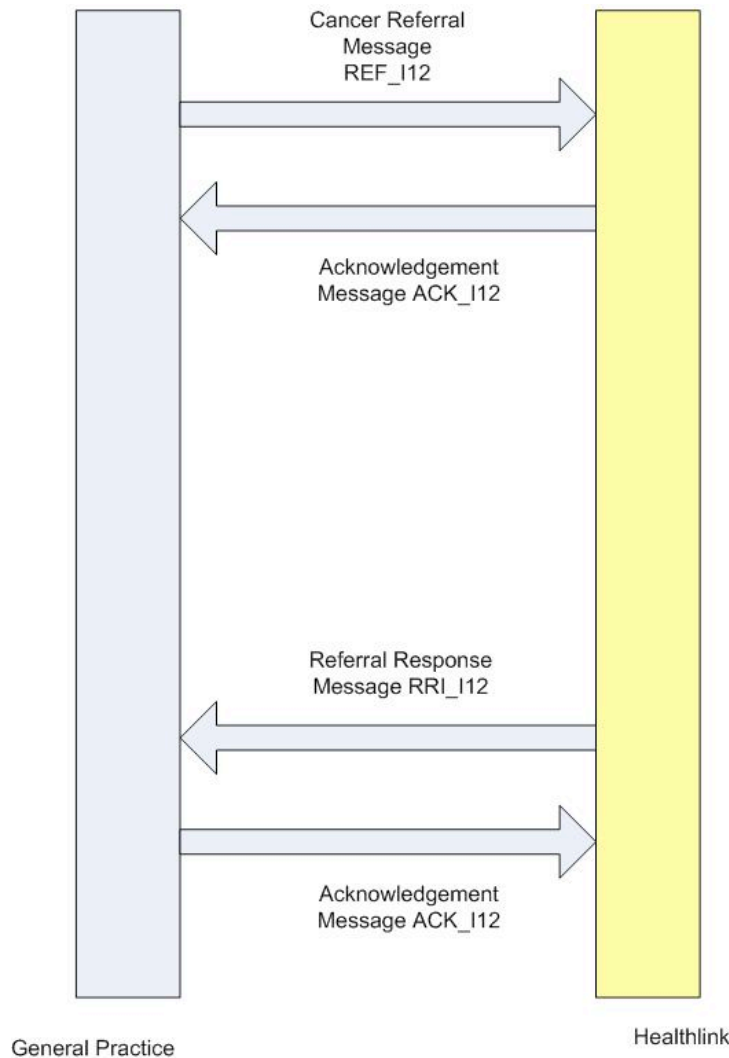
### 1. Document Aim

This document aims to help GP Software Vendors to send and receive acknowledgment messages.

### 2. Overview

When the practice software system sends a cancer referral message to Healthlink, an acknowledgement message is received back. When Healthlink sends a referral response message to the practice software system, an acknowledgment message is expected back. Refer to the web service document for detailed information on how to send and receive messages to and from Healthlink.

### 3. Message Flow



Message Flow Diagram  
version 0.1, dated 09/03/2009

Figure 1 Message Flow Diagram

This is the abstract message structure of an Acknowledgement Message. Segments within [ ] are optional. The chapter numbers in the table below relate to the relevant chapters in the HL7 version 2.4 standard.

<u>ACK</u>	<u>General Acknowledgment</u>	<u>Chapter</u>
MSH	Message Header	2
MSA	Message Acknowledgment	2
[ ERR ]	Error	2

**Table 1 Abstract Message Structure**

Please refer to the HL7 version 2.4 Standard (<http://www.hl7.org>) and the Acknowledgement Message Standard (HL7 2.4 Message Acknowledgement (v1.2)) for a full discussion of the use of Acknowledgement messages.

#### **4. Acknowledgement from Healthlink**

First of all, let us consider the acknowledgement message that comes from Healthlink in reply to the initial cancer referral message from the practice. Here is what it looks like.

```
<?xml version="1.0" encoding="UTF-8"?>
<ACK xmlns="urn:hl7-org:v2xml">
  <MSH>
    <MSH.1>|</MSH.1>
    <MSH.2>^~\&amp;</MSH.2>
    <MSH.3>
      <HD.1>HLONLINE.HEALTHLINK.13</HD.1>
    </MSH.3>
    <MSH.4>
      <HD.1> St. James's Hospital </HD.1>
      <HD.2>904.001</HD.2>
      <HD.3>L</HD.3>
    </MSH.4>
    <MSH.5>
      <HD.1>HELIXPM</HD.1>
      <HD.2></HD.2>
      <HD.3></HD.3>
    </MSH.5>
    <MSH.6>
      <HD.1> Dr. Smith, John </HD.1>
      <HD.2>3564</HD.2>
      <HD.3>L</HD.3>
    </MSH.6>
    <MSH.7>
      <TS.1>20090401162235</TS.1>
    </MSH.7>
    <MSH.9>
```

```

    <MSG.1>ACK</MSG.1>
    <MSG.2>I12</MSG.2>
  </MSH.9>
  <MSH.10> ACK200904011622353564</MSH.10>
  <MSH.11>
    <PT.1>P</PT.1>
  </MSH.11>
  <MSH.12>
    <VID.1>2.4</VID.1>
  </MSH.12>
</MSH>
<MSA>
  <MSA.1>AA</MSA.1>
  <MSA.2> REF200904011620543564</MSA.2>
</MSA>
</ACK>

```

The values for sending application and sending facility in the acknowledgement message are the same as the values for receiving application and receiving facility in the initiating cancer referral message and vice versa.

MSH.10 is the unique message control ID of the acknowledgement message and is not related to MSA.2, the message control ID of the cancer referral message that is being acknowledged.

The three possible values for MSA.1, Acknowledgement Code are:

- AA Application Acknowledgement
- AE Application Error
- AR Application Reject

This tells you whether the original cancer referral message, as identified in MSA.2, has been accepted by Healthlink.

An Application Reject acknowledgement may mean one of two things:

- There is a major problem with the message and it can not be validated by the receiving system;
- There is a problem with the receiving system and it is unable to process the message, though the message itself is fine;

An Application Error message means there is a problem with the content of the message. This should be diagnosed and corrected by the sending system before resending the message.

If you receive an acknowledgement message with an AA code in MSA.1 then you should notify your GP user that Healthlink received the referral message.

If you receive an acknowledgment message with an AE or AR code in MSA.1 then you should notify your GP user that:

- The referral message was not received by Healthlink;
- They should generate a new paper referral to the cancer centre;
- They should inform the software support help desk that an electronic cancer referral message has failed;

Healthlink will make use of the Message Error Segment (ERR) where an error is found in a referral message. The ERR Segment is used to add comments to acknowledgement messages.

SEQ	LEN	DT	OPT	RP/#	TBL#	ITEM #	ELEMENT NAME	IMPLEMENTATION NOTES
1	80	CM	R	Y		00024	Error Code and Location	Please see notes below.

**Table 2 Message Error (ERR) Segment**

**Notes:**

- The ERR segment is optional in an ACK message, but where it does appear the ERR.1 field is required.
- ERR.1, Error Code and Location, allows information on one or more errors to be described precisely, down to the subcomponent level.
- The ERR.1 field is repeatable, allowing for information on multiple errors to be displayed.
- The components of the ERR.1 field are:
  - segment ID, the three letter identifier of the segment in which the error occurred;
  - sequence, the Set ID of the segment if there is more than one segment with the same segment ID in the message;
  - field position, the field number within the segment where the error occurred;
  - code identifying error, taken from HL7 table 0357 Message Error Condition Codes and shown in Section 11 of this document.

Consider an example where an REF\_I12 referral message is missing the required fields PID.3 Patient Identifier and PID.5 Patient Name in the MSH Segment. In this case the ERR segment of the acknowledgment message, which would of course have AE in the MSA.1 field, would look as follows:

<ERR>

<ERR.1>

<ELD.1>

PID

</ELD.1>

<ELD.3>

3

</ELD.3>

<ELD.4>

<CE.1>

101

</CE.1>

<CE.2>

Required field missing

</CE.2>

<CE.3>

HL70357

</CE.3>

</ELD.4>

</ERR.1>

<ERR.1>

<ELD.1>

PID

</ELD.1>

<ELD.3>

5

</ELD.3>

<ELD.4>

<CE.1>

101

</CE.1>

<CE.2>

Required field missing

</CE.2>

<CE.3>

HL70357

</CE.3>

</ELD.4>

</ERR.1>

</ERR>

### **5. Referral Response Message**

When the Referral Response Message (RRI\_I12) comes from the specialist cancer centre it contains important information for the GP. This message has the following functions:

- Informs GPs that the cancer centre has received the referral;
- Informs GPs what time scale is in place for reviewing the patient, e.g. within 2 weeks, within 6 weeks or within 12 weeks for breast referrals;

OR

- If possible, informs the GP of the actual date of the patient's appointment;
- Requests that the GP performs further laboratory tests;
- Requests that the GP organise further imaging procedures;
- Requests that the GP provide specific medication to the patient;
- Remind the GP to please ensure that patients bring relevant X-Rays, Scans and Radiology reports with them to their appointment;

### **6. Acknowledgement to Healthlink**

The GP practice software system needs to validate the referral response message and issue an acknowledgement for it. The ACK message standard suggests that you validate an incoming referral response message against at least the following criteria:

- 1) The xml file is well formed;
- 2) The value in <MSH.6> Receiving Facility is as expected. This ensures that a general practice will not process results intended for another practice;
- 3) The value in <MSH.9> Message Type is one that is acceptable to the receiver;
- 4) The value in <MSH.12> Version ID is acceptable to the receiver;



5) The value in <MSH.11> Processing ID is appropriate for the application process handling the message;

If the message passes these tests the ACK returns an AA in MSA.1. The ACK is acknowledging you have received a message you can work with. It says nothing about whether the GP has read and accepted the message.

If any of these validations fail, the GP practice software rejects the message. That is, it creates an ACK message with AR in MSA.1, Acknowledgment Code.

Where a valid referral response message is received, the GP practice software system needs to notify the GP who made the initial cancer referral of the contents of the referral response message. There needs to be a failsafe procedure in place so that if this message is not viewed within a defined period of time, an alert is generated to other GPs and the practice manager or system administrator that the message remains unread. It is important and required that the system audit trail track the receipt of the referral response message, the reading of the message and any action that ensues.

Here is how the acknowledgement message generated by the practice software system looks:

```
<?xml version="1.0" encoding="UTF-8"?>
<ACK xmlns="urn:hl7-org:v2xml">
  <MSH>
    <MSH.1>|</MSH.1>
    <MSH.2>^~\&amp;</MSH.2>
    <MSH.3>
      <HD.1>HELIXPM.HEALTHLINK.13</HD.1>
    </MSH.3>
    <MSH.4>
      <HD.1> Dr. Smith, John </HD.1>
      <HD.2>3564</HD.2>
      <HD.3>L</HD.3>
    </MSH.4>
    <MSH.5>
      <HD.1>HEALTHLINKONLINE</HD.1>
      <HD.2></HD.2>
      <HD.3></HD.3>
    </MSH.5>
    <MSH.6>
      <HD.1> St. James's Hospital </HD.1>
      <HD.2>904.001</HD.2>
      <HD.3>L</HD.3>
    </MSH.6>
    <MSH.7>
      <TS.1>20090403150847</TS.1>
    </MSH.7>
    <MSH.9>
      <MSG.1>ACK</MSG.1>
  </MSH>
</ACK>
```

```

    <MSG.2>I12</MSG.2>
  </MSH.9>
  <MSH.10> ACK200904031508473564</MSH.10>
  <MSH.11>
    <PT.1>P</PT.1>
  </MSH.11>
  <MSH.12>
    <VID.1>2.4</VID.1>
  </MSH.12>
</MSH>
<MSA>
  <MSA.1>AA</MSA.1>
  <MSA.2> RRI200904011620543564</MSA.2>
</MSA>
</ACK>

```

## 7. Code Tables

HL7 Table 008, Acknowledgement Code (for original mode acknowledgements)

Value	Description
AA	Application Accept
AE	Application Error
AR	Application Reject

Table 3 HL7 Table 008 - Acknowledgement Code

HL7 Table 0357, Message Error Condition Codes (for the fourth component of the ERR.1 field)

Error Condition Code	Error Condition Text	Description/Comment
<b>Success</b>		
0	Message accepted	Success. Optional, as the AA conveys success. Used for systems that must always return a status code.
<b>Errors</b>		
100	Segment sequence error	The message segments were not in the proper order, or required segments are missing.
101	Required field	A required field is missing from a segment

	missing	
102	Data type error	The field contained data of the wrong data type, e.g. an NM field contained "FOO".
103	Table value not found	A field of data type ID or IS was compared against the corresponding table, and no match was found.
<b>Rejection</b>		
200	Unsupported message type	The Message Type is not supported.
201	Unsupported event code	The Event Code is not supported.
202	Unsupported processing id	The Processing ID is not supported.
203	Unsupported version id	The Version ID is not supported.
204	Unknown key identifier	The ID of the patient, order, etc., was not found. Used for transactions other than additions, e.g. transfer of a non-existent patient.
205	Duplicate key identifier	The ID of the patient, order, etc., already exists. Used in response to addition transactions (Admit, New Order, etc.).
206	Application record locked	The transaction could not be performed at the application storage level, e.g. database locked.
207	Application internal error	A catchall for internal errors not explicitly covered by other codes.

**Table 4 HL7 Table 0357 - Message Error Condition Codes**

### ***8. Addendum on Use of the Acknowledgement Message for General Referrals***

General Referrals will be implemented in hospitals in Cork/Kerry and Tallaght as part of the HSE South Electronic General Referral Project. This addendum describes the use of the Acknowledgement Message as part of this project.

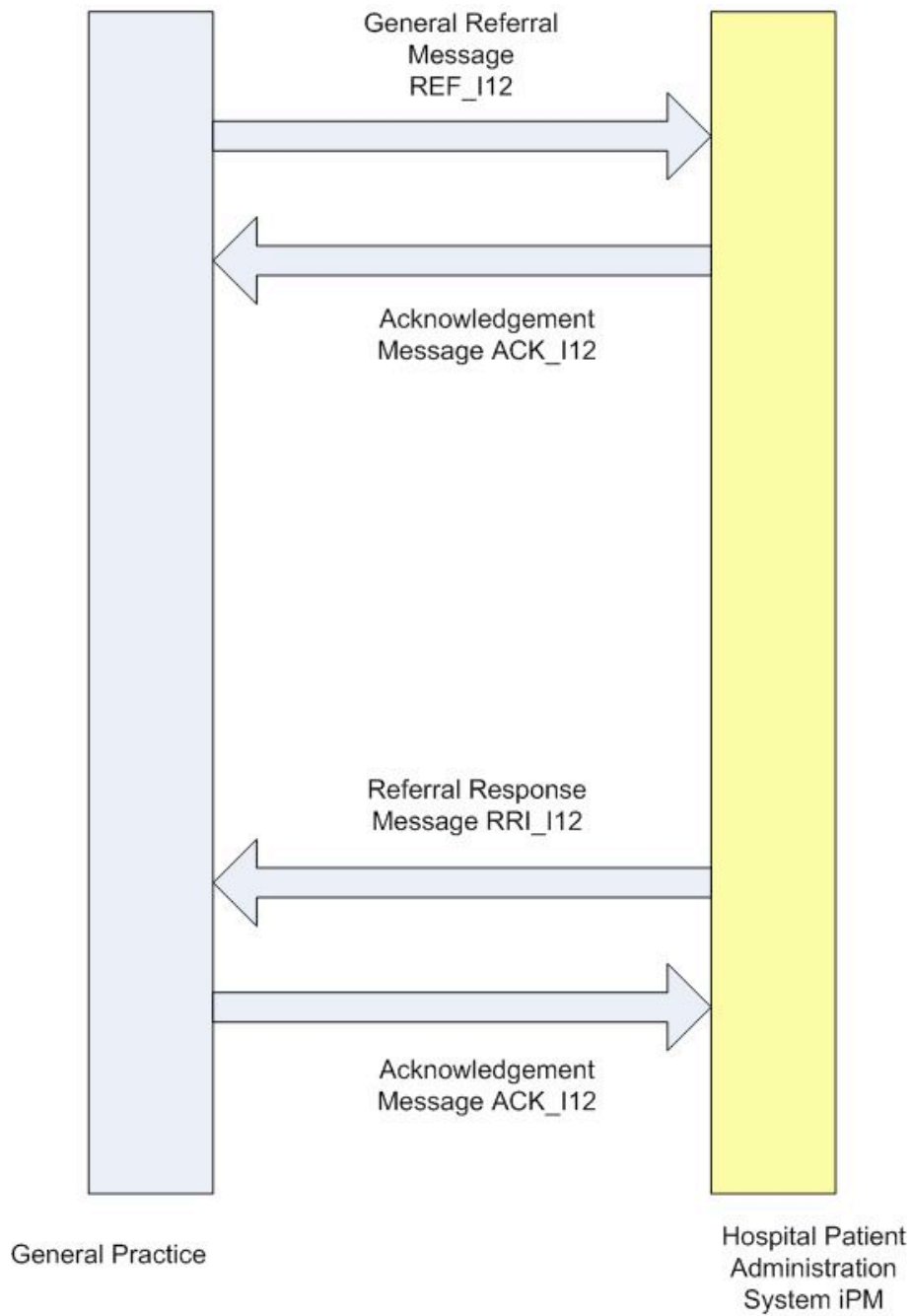
The architecture of the Acknowledgment Message is the same for cancer and for general referrals. The message flow is different in terms of the receiving application. In the case of the cancer referrals, the specialist cancer centres view and respond to the referrals using the Healthlink Online system. In the case of the general referrals, the clinical staff in the hospitals in Tallaght, Cork & Kerry,

use the hospital Patient Administration System i.PM to view and respond to the referrals.

Here is a table of differences between the acknowledgement message as used for cancer referrals and for general referrals.

<b>Topic</b>	<b>Comment</b>
2. Overview	The General Referral message goes from the GP system to i.PM and an Acknowledgement message is returned to the GP system. The Referral Response message will come from i.PM to the GP system and an Acknowledgement message back to i.PM is expected. This closes the loop on the communication.
3. Message Flow	The General Referral message moves from the GP system, through the Healthlink broker to the Hospital i.PM system. The referral response message returns from i.PM through the Healthlink broker to the GP system. See Figure 2 below.
4. Acknowledgement from Healthlink or i.PM	<p>When the GP system sends an electronic referral, it is validated as it passes through the Healthlink servers. The MSH &amp; PID segments are parsed and validated to ensure the data is correct. When the message is saved to the database it is also validated against a schema to ensure the format is correct.</p> <p>If there is a problem with the message a negative acknowledgement (NACK) is returned to the GP system from Healthlink. If all is well with the message validation, the general referral goes through to i.PM in the hospital and is acknowledged (ACK). Only one acknowledgement will come back to the GP system for the general referral, either a NACK from Healthlink or an ACK from i.PM.</p> <p>In the case of a General Referral ACK from i.PM the Sending Application will be i.PM:  &lt;MSH.3&gt; &lt;HD.1&gt;i.PM.HEALTHLINK.13&lt;/HD.1&gt;</p> <p>In the case of a NACK from Healthlink the Sending Application will be HLONLINE:  &lt;MSH.3&gt;&lt;HD.1&gt;HLONLINE.HEALTHLINK.13&lt;/HD.1&gt;</p>
5. Referral Response Message	<p>The functions of the referral response message for general referrals mirror those of the cancer referrals. The main functions are to inform the GP that:</p> <ul style="list-style-type: none"> <li>• The referral has been received;</li> <li>• The referral is accepted or rejected;</li> <li>• The details of the Triage Category of the referral;</li> </ul>

	<ul style="list-style-type: none"> <li>The appointment date or an appointment interval;</li> </ul>
6. Acknowledgement to i.PM	<p>The acknowledgement message will go back to the hospital iPM system. The Receiving Application will be i.PM.Healthlink.31  &lt;MSH.5&gt;&lt;HD.1&gt;i.PM.HEALTHLINK.31&lt;/HD.1&gt;</p> <p>and will reflect back the Sending Application, which came in the &lt;MSH.3&gt; field of the Referral Response message.</p>
Summary View	<p>Support for managing referrals and for tracking referral and response messages and acknowledgement messages is needed. The option of doing all referrals electronically will greatly increase the volume of referrals from GPs and supports the need for a usable system to monitor acknowledgements and responses to referrals. A summary screen to track all electronic referrals is required, including indications of which referrals have or have not been acknowledged and which have or have not received a response from the hospital.</p>
Importance of Acknowledgement Message	<p>If no acknowledgement message is received back from i.PM within 1 hour, then the hospital has not received the referral. It is vitally important that the GP is made aware of this fact. A situation where the GP thinks he or she has made a referral and the hospital patient administration system has not received a referral would be catastrophic for a patient. The GP needs to be aware that no acknowledgement means the referral has not been received. If this occurs the GP should print out the referral in paper format and post or fax it to the hospital. The GP should also alert his or her GP practice software company to the problem.</p>



Message Flow Diagram  
version 0.4, dated 02/08/2011

**Figure 2 Message Flow for General Referrals**