



Integrated Public Health Solutions

LINKS HL7 Implementation Guide

Version 7.2.3
November 14, 2014

Table of Contents

1.0 Benefits of LINKS to the Provider	4
2.0 Overview of IWeb Software	4
2.1 Data Exchange Options	4
2.2 Immunization Data Interface	5
2.2.1 HL7	6
2.2.1.1 LINKS HL7 Capabilities	6
2.2.1.2 Sample HL7 Messages	6
2.2.1.2.2 Acknowledgement (ACK) Message	6
2.2.1.2.3 Vaccination Query (VXQ) Message	6
2.2.1.2.4 Query Acknowledgement (QCK) Message	6
2.2.1.2.5 Vaccination Query Possible Match (VXX) Message	7
2.2.1.2.6 Vaccination Query Record (VXR) Message	7
2.3 File Size & Data Migration	7
2.4 Deduplication (Patient Matching)	7
2.5 Required and Expected Fields	7
2.5.1 IWeb Fields for Data Import	8
2.5.1.1 LINKS Required Data Fields	8
2.6 Submitting HL7 Data	13
3.0 Resources	14

List of Tables and Figures

Table 1-1: Data Fields	8
------------------------------	---



Louisiana Department of Health & Hospitals

628 N. 4th Street

P.O. Box 629 (Zip 70821-0629)

Baton Rouge, LA 70802

Phone: (225)342-9500

Fax: (225)342-5568

Immunization Program

1450 L & A Road

Metairie, LA 70001 Phone: (504) 838-5300

Fax: (504) 838-5206



Louisiana Immunization Network for Kids Statewide (LINKS)

<https://linksweb.oph.dhh.louisiana.gov/linksweb/main.jsp>

1.0 Benefits of LINKS to the Provider

- Real-time electronic system eliminates lag time of viewing immunization data after reporting.
- Reduces paperwork.
- Provides easy access to consolidated patient immunization records.
- Decreases the need to pull and re-file paper patient records.
- Consolidates immunizations from multiple providers into one record.
- Source for obtaining immunization histories for patients.
- Generates parental reminder notices on due, overdue or invalid immunizations.
- Supports efforts to improve immunization coverage rates.
- Supports the ability to recall vaccines based on manufacturer error.
- Prints a completed official Immunization Certificate of Compliance (Form 121).
- Reduces calls from schools and day care centers during registration.
- Provides vaccine inventory management.
- Generates doses administered and immunization assessment reports upon demand.
- Forecasting recommendations based on the ACIP/AAP schedule.
- Satisfies “Meaningful Use” Criteria for interfacing with existing EMR/EHRS.

2.0 Overview of IWeb Software

IWeb is a population-based immunization registry that helps public health agencies and vaccine providers make informed decisions that improve the health of children and the entire community. IWeb is a web-based product which is used by public health officials, public health employees, and private providers by enabling:

- Vaccinators to view a child’s complete vaccination record, thus preventing over and under vaccination.
- Health officials to measure and improve vaccination rates by providing a big picture through various reports.
- Health officials to send mailings to remind parents of needed vaccinations.
- School nurses to review student vaccination records, update, and report immunization status as required by law.

2.1 Data Exchange Options

The following options are available for electronic data exchange with LINKS.

- 1) Provider’s system to LINKS (Unidirectional) – immunization data entered into Provider system
 - One way data exchange
 - Provider uses their application as the single system to enter immunization data.
 - Sends immunization data FROM the provider’s system to LINKS
 - HL7 (real time or batch)
 - EHR / other system

2) LINKS to Provider EHR (Unidirectional) – immunization data entered into LINKS

- One way data exchange
- HL7 (real time or batch) (PHC HUB)
- Provider uses LINKS as single system to enter immunization data
- EHR must be capable of receiving data and displaying in the EHR application
- EHR receives data as a reciprocal message or by querying individual patient records in LINKS
- Provider benefits from full functionality of LINKS

3) Data exchange with LINKS and Provider EHR (PHC HUB) (Bidirectional)

- Real Time Query
 - Verified historical data sent to LINKS
 - Newly registered patients sent to LINKS
 - Query capability built into provider system
 - LINKS sends back data not in provider system to include shots and forecast
 - Provider system sends new data to LINKS
- Reciprocal batch updates
 - Verified historical data sent to LINKS
 - Newly registered patients sent in batch
 - LINKS sends updates whenever something changes in LINKS
 - Includes demographic changes
 - Response messages take 24 – 72 hours to show up in other system
 - Initiated by provider system

4) Hybrid Solutions (provider uses LINKS as immunization data repository)

- Populate LINKS with demographic data on all patients from the Provider's EHR and user information
- In provider application, https link to LINKS
- User information sent and patient query data sent to LINKS
- User logged into LINKS in context – LINKS window displayed on user screen
- Provider uses LINKS to enter immunization data
- Allows provider to use full capability of LINKS system
- Creates look and feel in EHR that LINKS is the EHR's immunization module.
- Immunization data does not transfer to the Provider EHR

2.2 Immunization Data Interface

The HL7 interface supports CDC standard immunization messages and is the recommended format for submitting immunization data to LINKS.

Providers should have at least 250 patients with immunizations in their EMR so that adequate technical and data quality testing can be completed prior to taking an electronic interface LIVE.

Providers that do not traditionally provide immunizations (pulmonologist, cardiologist, etc.) should have at least 10 patient records with immunizations in their EMR or a mutually agreed-upon number of tests so that adequate technical and data quality testing can be completed prior to taking the electronic interface LIVE.

Providers that choose to interface with LINKS through the Louisiana Health Information Exchange (LaHIE), should follow the LaHIE's specifications and requirements. These providers may be able to proceed to production (LIVE) interface (NON-VFC) with one successful test data submission.

Providers are responsible for keeping their vaccination codes in their application current and ensure that staff is using the appropriate vaccinations in their EMR documentation to preserve LINKS data integrity during testing and on an ongoing basis. Provider must adhere to data requirements as described in Section 2.5.1.1

2.2.1 HL7

LINKS sends and receives HL7 immunization queries and updates. These messages conform to HL7 specification version 2.3.1/2.5.1 and the CDC's Implementation Guide for Immunization Transactions version 2.1 which can be found here:

<http://www.cdc.gov/vaccines/programs/iis/stds/downloads/hl7guide.pdf>

2.2.1.1 LINKS HL7 Capabilities

- Accepts the following patient update messages: VXU, ADT, DFT, and ORU.
- Responds to immunization record query messages: VXQ. QBP
- Queries external registries by sending immunization record query messages: VXQ. QBP
- Sends batch updates to external registries: VXU.

2.2.1.2 Sample HL7 Messages (2.3.1 & 2.5.1)

2.1.2.2.1 Vaccination Update (VXU) Message (2.3.1)

```
MSH|^~\&|^STC-IWeb&2.10.0.1^|KEVIN^STC-Nathan^|nathan^STC-IWeb^|^savetofile^|
20050608111146||VXU^V04|1118254306762.100000010|P|2.3.1|
PID|1||43773^^^^MR||DOE^JOHN^C^^^^L||19420915|M|^^^^^^^^^^^^^^^^^^^^N|
PD1|||^^^^^^MR|^^^^^^^^^^^^^^MR|^^^^^^^^^^^^^^MR|^^^^^^^^^^^^^^MR|02^Reminder/recall -any method^HL70215|||| A^Active^HL70441|
ZSP|^PH^FX^INTERNET^NET|
PV1||R|
RXA|0|999|20041214|20041214|33^pneumococcal^CVX^90732^Pneumococcal (PPV23)^CPT~
31^Pneumococcal (PPV23)^STC0292|999||00^New immunization record^NIP001|A|20050608111146|
RXR|OTH^Other/Miscellaneous^HL70162|
ZSV|^^^^^^MR~^^^^^^SR|^PH^FX^INTERNET^NET|
RXA|0|999|20021122|20021122|15^influenza, split (incl. purified surface antigen)^CVX^ 90658^Influenza
Split^CPT~61^Influenza Split^STC0292|999||00^New immunization record^ NIP001|A|20050608111146|
RXR|OTH^Other/Miscellaneous^HL70162|
RXA|0|999|20041214|20041214|15^influenza, split (incl. purified surface antigen)^CVX^ 90658^Influenza
Split^CPT~61^Influenza Split^STC0292|999||00^New immunization record^ NIP001|A|20050608111146|
RXR|OTH^Other/Miscellaneous^HL70162|
```

2.2.1.2.2 Acknowledgement (ACK) Message (2.3.1)

```
MSH|^~\&|^DOE^^|DCC^^|DOE^^|20050829141336||ACK^|1125342816253.100000055|P|2.3.1|
MSA|AE|00000001|Patient id was not found, must be of type 'MR' ||^HL70357|
ERR|PID^1^3^^HL70357|
```

2.2.1.2.3 Vaccination Query (VXQ) Message (2.3.1)

```
MSH|^~\&|^DBO^QSInsight^L|QS4444|5.0^QSInsight^L||20030828104856+0000||VXQ^V01|QS444437861000000042|P|2.3.1||NE|
AL|
QRD|20030828104856+0000|R|I|QueryID01||5|000000001^Bucket^Pail^^^^^^MR|VXI|SIIS|
QRF|QS4444|20030828104856+0000|20030828104856+0000||100000001~19460401~~~~~1 Somewhere Lane
Boulevard^Indianapolis^IN~10000|
```

2.2.1.2.4 Query Acknowledgement (QCK) Message (2.3.1)

```
MSA|AA|QS444437861000000042|No patients found for this query|
QAK||NF|
```


2.4.1 LINKS Fields for Data Import

LINKS has several fields that are required. This means that files that do not include this information 100% of the time will fail to import into LINKS. Those fields required by LINKS will technically import but will not be accepted by LINKS unless the acceptance threshold is met during the testing phase.

2.4.1.1 LINKS Required Data Fields

Table 1.1 Data Fields

* = % correctly populated during testing

FIELD	REQUIRED BY LINKS, RECOMMENDED BY LINKS	ACCEPTANCE THRESHOLD *	HL7
GUARDIAN FIELDS			
Name First	✓ Required (will consider guarantor in lieu of guardian)	100%	NK1-2.2
Name Last	✓ Required (will consider guarantor in lieu of guardian)	100%	NK1-2.1
Name Middle			NK1-2.3
Phone			NK1-5
Relationship	✓ Required	100%	NK1-3
Social Security Number			NK1-33
PATIENT FIELDS			
Address City	✓ Required	100%	PID-11.3
Address Parish			PID-11.9
Address State	✓ Required	100%	PID-11.4
Address Street1	✓ Required	100%	PID-11.1
Address Street2			PID-11.1
Address Zip	✓ Required	100%	PID-11.5
Alias First			PID-9
Alias Last			PID-9
Birth Country			PID-11.6
Birth Date	✓ Required	100%	PID-7
Birth File Number			PID-3

Birth Multiple	Recommended (multiple births)		PID-24
Birth Order	Recommended (multiple births)		PID-25
Birth State			PID-11.4
Comment			
Deceased			PID-30
Patient Eligible VFC	✓ Required		PV1-20 (2.3.1 messages)
Ethnicity	Recommended if EMR is capable		PID-22
Facility Address City			
Facility Address State			
Facility Address Street 1			
Facility Address Street 2			
Facility Address Zip			
Facility Email			
Facility Fax			
Facility Phone			
Facility Health District			
Gender	✓ Required	100%	PID-8
Facility Id Remote	✓ Required	100%	PD1-3
Facility Name	✓ Required	100%	PD1-3
Health District			
Immunization Registry			PD1-16
Inactive Code			PD1-16
Medicaid Number	✓ Recommended ✓ Required if EMR is capable		PID-3
Mother Maiden Name	✓ Recommended ✓ Required if EMR is capable		PID-6

Patient Name First	✓ Required	100%	PID-5.2
Patient Name Last	✓ Required	100%	PID-5.1
Name Middle	✓ Recommended ✓ Required if EMR is capable	80%	PID-5.3
Name Suffix			PID-5.4
Patient External Id (Medical Record Number)	✓ Required	100%	PID-3
Patient Internal Id			PID-3
Phone	✓ Recommended ✓ Required if EMR is capable	80%	PID-13.1
Physical Address Street 1			PID-11.1
Physician Bomex Number			PD1-4
Physician Id Local			PD1-4
Physician Id Remote			PD1-4
Physician Name First			PD1-4
Physician Name Last			PD1-4
Physician Name Middle			PD1-4
Physician Name Suffix			PD1-4
Physician SSN			PD1-4
Primary Language			PID-15
Publicity Code			PD1-11
Race	✓ Required	100%	PID-10
Race 2			PID-10
Race 3			PID-10
Race 4			PID-10
Race 5			PID-10
Social Security Number	✓ Recommended if EMR is capable	80%	PID-3
VACCINATION FIELDS			
Action Code	✓ Recommended if EMR is capable	100%	RXA-21

Administered Amount	✓ 100% required	100%	RXA-6
Comment			RXA-9
Contraindication			OBX-3 & OBX-5
Dose	✓ 100% required	100%	RXA-2
FacilityAddressCity			RXA-11
FacilityAddressState			RXA-11
Facility Address Street 1			RXA-11
Facility Address Street 2			RXA-11
Facility Address Zip			RXA-11
Facility Email			
Facility Fax			
Facility Id Local	✓ 100% Required	100%	RXA-11.1 (2.3.1) or RXA-11.4 (2.5.1)
Facility Id Remote			RXA-11
Facility Name			RXA-11
Facility Phone			
Form VIS Given Date	✓ Required	100%	OBX-3 & OBX-5
Historical	✓ Required for all historical doses. Not required for administered doses.		RXA-9
Indication			RXA-19
Induration TB			
Physician Bomex Number			RXA-10
Physician Id Local	✓ Recommended ✓ Required if EMR is capable	100%	RXA-10
Physician Id Remote			RXA-10
Physician Name First			RXA-10

Physician Name Last			RXA-10
Physician Name Middle			RXA-10
Physician Name Suffix			RXA-10
Physician SSN			RXA-10
Publication Date VIS 1	✓ Recommended ✓ Required if EMR is capable		OBX-3 & OBX-5
Publication Date VIS 2			
Publication Date VIS 3			
Publication Date VIS 4			
Route	✓ required	100%	RXR-1
Site	✓ required	100%	RXR-2
Vaccination Date	✓ Required	100%	RXA-3
Vaccinator			RXA-10
Vaccine Code CPT	✓ recommended if EMR is capable		RXA-5
Vaccine Code CVX	✓ required	100%	RXA-5
Vaccine Code PCI			RXA-5
Vaccine Eligible VFC	✓ required	100%	OBX-3 & OBX-5
Vaccine Lot Number	✓ required	100%	RXA-15
Vaccine Manufacturer	✓ required	100%	RXA-17
Vaccine Manufacturer Code	✓ required	100%	RXA-17
Vaccine Name	✓ required	100%	RXA-5
Vaccine Publicly Supplied	✓ required	100%	OBX-3 & OBX-5

QUERY FIELDS			
Father Name First			QRF-5
Father Name Last			QRF-5
Father Social Security Number			QRF-5
Mother Name First			QRF-5
Mother Name Last			QRF-5
Mother Name Maiden			QRF-5
Mother Social Security Number			QRF-5
Patient Address 1 City	✓ Required	100%	QRF-5
Patient Address 1 State	✓ Required	100%	QRF-5
Patient Address 1 Street 1	✓ Required	100%	QRF-5
Patient Address 1 Zip	✓ Required	100%	QRF-5
Patient Birth Date	✓ Required	100%	QRF-5
Patient Id (MRN)	✓ Recommended ✓ Required if EMR is capable		QRD-8
Patient Medicaid Number			QRF-5
Patient Name First	✓ Required	100%	QRD-8
Patient Name Id Type Code			QRD-8
Patient Name Last	✓ Required	100%	QRD-8
Patient Name Middle	✓ Recommended		QRD-8
Patient Name Suffix			QRD-8
Patient Phone Number	✓ Recommended		QRF-5
Patient Social Security Number			QRF-5
Quantity Limit			QRF-7
What Subject Filter			QRD-9
When Date End			QRF-2
When Date Start			QRF-3

Patient Internal Id (SIIS ID)			QRD-8
-------------------------------	--	--	-------

2.5 Submitting HL7 Data

HL7 message files may be uploaded automatically via HTTPS. Applications that can generate a file or use TCP/IP but can't connect via HTTPS may install the HL7 Bridge on their local server to submit directly to LINKS.

If the file is automated, we request that they are sent nightly when LINKS is not generally in use. File must comply with data requirements as described in Section 2.4.1.1

Request: When the sending application sends LINKS an HL7 message via an HTTPS POST command, it must have the following fields:

- USERID - Assigned by the LINKS administrator.
- PASSWORD - Assigned by the LINKS administrator.
- MESSAGEDATA - The HL7 message(s).

HL7 messages may be one at a time (one for every HTTPS request) or together as a batch. Batched messages do not require special separators or wrappers.

Response: LINKS always returns responses in HL7 format. Responses are returned based on how the account is configured in LINKS. The response configurations available are Always, Never, On Error (only for those messages are not accepted) or Determined by Message (Incoming request message indicates in the MSH segment whether to always, never or only on error).

The HL7 response can indicate any one of the following things:

- Authentication error - username and password are incorrect or account does not have permission to accept HL7
- Message parsing error – incoming messages do not conform to HL7 standards
- Message content error – incoming message is missing or incorrect information
- Message processing exception – incoming message has an unexpected problem
- Message accepted - data has been accepted and has been sent to deduplication
- Response to query – LINKS responds to query with query results

3.0 Resources

This immunization registry conforms to standards published by the CDC and the state of Louisiana standards. For the latest code sets and standards please see:

<http://www2a.cdc.gov/vaccines/iis/iisstandards/vaccines.asp?rpt=cvx>

For more detailed information about how IWeb processes HL7 data, please see the *IWeb HL7 Interface Specification Guide*.