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DEPT. OF HEALTH AND HUMAN SERVICES

Nebraska Parkinson's Disease Registry
HL7 – 2.5.1 & Real-time Transfer Specification

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Contents

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Introduction

The Nebraska State Parkinson's Disease Registry HL7 – 2.5.1 & Real-time Transfer Specification serves as implementation guide for the State of Nebraska. The use case describes the transmission of Parkinson's diagnostic findings to the Nebraska Department of Health and Human Services using the HL7 2.5.1 ADT^A28 and ADT^A31 message. It does not cover querying patient demographics or querying of diagnostic reports.

With digitization of health care system data, it has become advantageous for health systems and public health departments to coordinate on electronic standards and subsequently establish electronic feeds of reportable data to health departments. In particular, the transfer specification addresses the messaging format and corresponding required and optional content. The electronic reporting guide does not replace the need for configuration and documentation of the constraints of specific implementations.

The Health Level Seven (HL7) Standard

The ANSI HL7 standard is widely used for data exchange in the health care industry. This document covers the subset of HL7 that will be used for client and Parkinson's Disease records exchanged between NPDR and outside systems.

- The basic unit transmitted in an HL7 implementation is the **message**.
- Messages are made up of several **segments**, each of which is one line of text, beginning with a three-letter code identifying the segment type.
- Segments are in turn made up of several **fields** separated by a delimiter character, "|".

```
MSH|^~\&|IRPH|IRPH|NPDR|NPDR|19991005032342||ADT^A28^ADT_A05|682299|P^|2.5.1^^|||ER
PID|||79928^^^VALCLIN^PI||SMITH^MARY^T|JOHNSON|19951212|F||||
DG1|1||G20^Parkinson's Disease^I10||20190601|2||||||||||NPI0000031^last
name^first31^^^^^IRPH^^^^^NPI|||||A
```

The details of how HL7 messages are put together, for NPDR purposes, will be explained later in this document. The example above shows the essentials of what a message looks like. In this example, a message is being sent on behalf of IRPH Clinic to NPDR. The message consists of three segments. NOTE: IRPH Clinic may or may not be the actual transmitter of the message. The transmitter of the message will be identified by NPDR from log-in information and not from an HL7 message.

- The Message Header segment (**MSH**) identifies the owner **IRPH CLINIC** (IR Physicians) of the information being sent and the receiver (**NPDR**). It also identifies the message as being of type **VXU.** The VXU is an Unsolicited Vaccination Record Update, which is one of the message types defined by HL7.
- The Patient Identification segment (**PID**) gives the client's name (MARY T SMITH), birth date (19951212, in YYYYMMDD format), and other identifying fields.
- The Diagnosis segment (ORC) tells that the ICD-10 code G20 for Parkinson's Disease is diagnosed on 20190601 (in YYYYMMDD format), and diagnosing clinician information.

HL7 does not specify how messages are transmitted. It is flexible enough to be used for both real-time interaction and large batches. The standard defines file header and file trailer segments that are used when several messages are gathered into a batch for transmission as a file. NPDR will provide a response according to the type of file initially submitted via data exchange. If data was batched, the NPDR response will be a batch. Likewise, if the data submitted was a single record, NPDR will respond to that single record.

Scope of this Document

The General Transfer Specification (GTS) documented here supports automated exchange of data between the NPDR repository and outside systems. This allows both the client and immunization records to be available in both systems, to avoid the need to enter data twice. The remainder of this document specifies how HL7 file messages are constructed for the purposes of NPDR. It does not cover the methods that are used to transmit files between the NPDR central repository and outside systems. It covers only a small subset of the very extensive HL7 standard. Files of messages constructed from the guidelines in this document will fall within the HL7 standard, but there are a wide variety of other possible HL7 messages that are outside the scope of this document.

References

- See Version 2.5.1 of the Health Level 7 standard for a full description of all messages, segments, and fields. Information regarding HL7 is at www.hl7.org.

HL7 Message Types used in NPDR Transmissions

NPDR uses these message types: ADT, and ACK.

The ADT is used for sending client data, symptoms, medication history and diagnosis.
The ACK is used to acknowledge to the sender that a message has been received.

The tables below show the segments that are used to construct each message type. Each segment is one line of text ending with the carriage return character. The carriage return is needed so that the HL7 messages are readable and printable. The messages may appear somewhat cryptic due to the scarcity of white space. (The standard has provisions for inclusion of binary data, but NPDR will not use these features.)
[ ] square brackets enclose optional segments.
{} curly braces enclose segments that can be repeated.
[{ }] optional and repeating.
Not [] or {} Required

For example, [{NK1}], any number of NK1 segments could be included in the message.

The full HL7 standard allows additional segments within these message types, but they are unused by NPDR. In order to remain compliant with HL7, their use will not result in an error, but the recipient can ignore the content of the message. The segments that are documented here are enough to support the principal NPDR functions of storing data about clients and immunizations.

ADT (ADT^A28 and ADT^A31)
Unsolicited Update Patient Administration

MSH	Message Header
[EVN]	
PID	Patient Identification
[PD1]	Patient Additional Demographic
[{NK1}]	Next of Kin / Associated Parties
[PV1]	Patient Visit – Additional Info.
[{OBX}]	Observation/Result
[{DG1}]	Diagnosis Information

ACK
General Acknowledgment

MSH	Message Header
MSA	Message Acknowledgment
[{ERR}]	Error Segment

Message Segments: Field Specifications and Usage

HL7 Segment Structure
Each segment consists of several fields that are separated by "|", which is the field separator character. The tables below define how each segment is structured and contain the following columns:

1. **SEQ** — The ordinal position of the field in the segment. Since NPDR does not use all possible fields in the HL7 standard, these are not always consecutive.
2. **LEN** — Maximum length of the field
3. **DT** — HL7 data type of the field. See below for definition of HL7 data types.
4. **R/M** — R means required by HL7, and M means mandatory for NPDR. Blank indicates a required but may be empty field. CE means conditional but may be empty.
5. **RP/#** — Y means the field may be repeated any number of times, an integer gives the maximum number of repetitions, and a blank means no repetition is permitted.
6. **TBL#** — Number of the table giving valid values for the field.
7. **ELEMENT NAME** — HL7 name for the field.

- **HL7 data types.** Each field has an HL7 data type. Appendix A of this document lists and defines the HL7 data types needed for NPDR. The elemental data types Numeric (NM) and String (ST) consist of one value, while some data types, such as Extended Person Name (XPN) are composites.
- **Delimiter characters.** Field values of composite data types consist of several components separated by the **component separator**, "^". When components are further divided into sub-components, these are separated by the **sub-component separator**, "&". Some fields are defined to permit repetition separated by the **repetition character**, "~". When these special characters need to be included within text data, their special interpretations are prevented by preceding them with the **escape character**, "\".

```
MSH|^~\&| .....
XXX|field1|component1^component2^subcomponent3.1&subcomponent3.2^component4| .....
YYY|repetition1~repetition2| .....
ZZZ|data includes escaped \|\~ special characters| .....
```

In the example above, the Message Header segment uses the field separator, "|", immediately after the "MSH" code that identifies the segment. This establishes what character serves as the field separator throughout the message. The next field, the four characters "^~\&", establishes, in order, the component separator character, the repetition character, the escape character, and the sub-component separator character that will apply throughout the message. The hypothetical "XXX" segment includes field1 with no internal structure, but the next field has several components separated by "^", and the third of these is made up of two sub-components separated by "&". The hypothetical "YYY" segment's first field permits repetition, in this example the two values "repetition1" and "repetition2". The hypothetical "ZZZ" segment's field has a text value that includes the characters "|~", and these are escaped to prevent their normal structural interpretation.

In NPDR, sub-components, repetition and text values requiring the escape character will be rare. Components within fields are common, since names and addresses are represented this way. HL7 permits the use of other delimiters besides the recommended ones and the delimiters used in each message are given in the Message Header segment. NPDR will always use the recommended delimiters when sending files and requires their use for files received.

Rules for Sending Systems
The following rules are used by sending systems to construct HL7 messages.
- Encode each segment in the order specified in the message format.
- Begin the segment with the 3-letter segment ID (for example MSH).
- Precede each field with the data field separator ("|").
- Use HL7 recommended encoding characters ("^~\&").
- Encode the data fields in the order given in the table defining segment structure.
- Encode the data field according to its HL7 data type format.
- Do not include any characters for fields not present in the segment. Since later fields in the segment are encoded by ordinal position, fields that are not present do not reduce the number of field separators in the segment. For example, when the second and third fields are not present, the field separators maintain the ordinal position of the fourth field: |field1|||field4
- Data fields that are present but explicitly null are represented by empty double quotes "".
- Trailing separators may optionally be omitted. For example, |field1|field2||||| is equivalent to |field1|field2, when field3 and subsequent fields are not present.
- End each segment with the segment terminator (<u>always</u> the carriage return character, ASCII hex 0D).

The following rules are used by receiving systems to process HL7 messages.

- Treat data segments that are expected but not present as if all data fields in the segment were not present.
- Require use of HL7 recommended Field Separator |, and Encoding characters ^~\& for encoding messages.
- Ignore any data segment that is included but not expected, rather than treating it as an error. The HL7 message types used by NPDR may include many segments besides the ones in this document, and NPDR ignores them. NPDR will not send messages with segments not documented in this specification, but reserves the right to specify more segments later. The rule to ignore unexpected segments facilitates this kind of change.
- Ignore data fields found but not expected within a segment.

The message segments below are needed to construct message types that are used by NPDR. Each segment is given a brief description excerpted from the HL7 standard. The tables define what fields make up each segment. Since NPDR does not use all the fields that HL7 defines, there are sometimes gaps in the ordinal sequence of fields. Following HL7 rules, the gaps do not diminish the number of field separators within the segment. For example, if the second and third fields in a segment are not present, their field separators remain in order to indicate that the next field present is the fourth: field1|||field4.

Segments in ADT^A28 and ADT^A31

MSH

The MSH segment defines the intent, source, destination and some specifics of the syntax of a message.

SEQ	LEN	DT	R/M	RP/#	TBL#	ELEMENT NAME
1	1	ST	R			Field Separator
2	4	ST	R			Encoding Characters
3	180	HD	RE			Sending Application
4	180	HD	R			Sending Facility
5	180	HD	RE			Receiving Application
6	180	HD	RE			Receiving Facility
7	26	TS	R			Date/Time of Message
9	7	CM	R			Message Type
10	20	ST	R			Message Control ID
11	3	PT	R		0103	Processing ID
12	60	VID	R		0104	Version ID
15	2	ID	R		0155	Accept Acknowledgment Type
16	2	ID	R		0155	Application Acknowledgment Type
21	427	EI	RE			Message Profile Identifier
22	180	XON	RE			Sending Responsible Organization
23	180	XON	RE			Receiving Responsible Organization

Field Notes:

MSH-1   Determines the field separator in effect for the rest of this message. NPDR requires the HL7 recommended field separator of "|".

MSH-2   Determines the component separator, repetition separator, escape character, and sub-component separator in effect for the rest of this message. NPDR requires the HL7 recommended values of ^~\&.

MSH-3   Name of the sending application. When sending, NPDR will use "NPDR" followed by the current version number of the registry. See MSH-4 and MSH-6 for the fields principally used to identify sender and receiver of the message.

MSH-4   Required by NPDR. Segment identifies for whom the message is being sent (the owner of the message information). When sending, NPDR will use "NPDR". When the message is being sent to NPDR and the Provider Organization owning the information is different than the organization transmitting the message, use either the NPDR Provider ID of the Provider Organization that owns the information preceded by a component separator (e.g., ^36) or the short Provider Organization name (e.g., IRPH.) This value is required for inventory deduction via data exchange.

MSH-5   Identifies the receiving application. Acceptable values for this field are "NPDR", "NPDR" and <empty>.
If value "NPDR" is submitted, process as NPDR message.
If value other than "NPDR" is submitted, process as NESIIS message.
If value other than "NPDR" and "NESIIS" is submitted, discard and store <empty> value in database, and process as NESIIS message.

MSH-6   Identifies the organization responsible for the operations of the receiving application. Acceptable values for this field are "NDHHS," "NPDR," and <empty>. If value other than "NDHHS" or "NPDR" is submitted, discard and store <empty> value in database.

MSH-7   Date and time the message was created. NPDR ignores any time component. See the TS data type.

MSH-9   This is a required field. Three components of this field give the HL7 message type (see Table 0076) and the HL7 triggering event (see Table 0003) and the HL7 Message Structure (HL7 Table 0354). Within HL7, the triggering event is considered to be the real-world circumstance causing the message to be sent. For NPDR purposes, this field should have the following values; ADT^A28^ADT_A05, and ADT^A31^ADT^A05 for ADT messages. In acknowledgement messages the value ACK is sufficient and the second component may be omitted.

MSH-10   This is a required field. Message rejection will result if nothing is received in this field. The message control ID is a string (which may be a number) uniquely identifying the message among all those ever sent by the sending system. It is assigned by the sending system and echoed back in the ACK message sent in response.

MSH-11   The processing ID to be used by NPDR is **P** for production processing. If any value other than P is submitted, an error message is generated indicating that NPDR is defaulting to **P**. If this field is blank, the record is rejected and an error message is generated.

MSH-12   This is a required field. For the parser, the version number that is read in the first MSH segment, of the file, will be the version assumed for the whole file. For example, use a value of "2.5.1" to indicate HL7 Version 2.5.1. NPDR will accept HL7 Version 2.5.1. Messages conforming to the specifications in this Guide shall indicate that the version is 2.5.1. If there is no version number found in the first MSH segment, a hard error will occur and the file will not be processed.

MSH-15   This field identifies the conditions where a system must return accept acknowledgments to this message. Acceptable values are AL (Always), ER (Error/Reject Conditions Only), and <empty>. If value other than ER is submitted, or the field is left blank, NPDR assigns it ER value. NPDR ignores this value from sending organizations.

MSH-16   Controls what type of acknowledgement (ACK) NPDR generates for each message in the file submitted. If MSH-16 is submitted NPDR is required to process the value and generate the appropriate message. Acceptable values are AL (Always), ER (Error/Reject Conditions Only), and <empty>. If value other than AL or ER is submitted, or the field is left blank, NPDR assigns it AL value. If populated with a value of AL, NPDR will return full acknowledgment of every message inside the file submitted.

   Note: The value provided in MSH-16 directly impacts the ability of NPDR to analyze messages for accuracy. While NPDR can technically accept a value of 'NE' in MSH-16, this value does not return feedback to the sending organization **and** prohibits NPDR from properly analyzing the message for data quality. As such, it will not be an allowed value for data exchange.

MSH-21   Contains the profile used when responding to a query. NPDR does not require this field.

MSH-22   Identifies business organization that originated and is accountable for the content of message. This value, if sent, should match the value in MSH-4. If the value is different from MSH-4, NPDR will store the value from MSH-4, and return an error message.

MSH-23   Identifies business organization that is the intended receiver of the message and is accountable for acting on the data conveyed by the transaction. Value in this field is ignored for inbound files, should return same value as MSH-6 in outbound file.

EVN

The EVN segment is used to send event information. NPDR will not validate inbound EVN.

SEQ	LEN	DT	R/M	RP/#	TBL#	ELEMENT NAME
1	3	ID	RE		0003	Event Type Code
						NPDR acceptable values are A28, A31
2	26	TS	RE			Recorded Date/Time

Field Notes:

EVN-1   This field contains event type code. We recommend using the second component of MSH-9 (trigger event). Values are A28 or A31.

EVN-2   This field contains date/time of the transaction.

PID

The PID segment is used by all applications as the primary means of communicating patient identification information. This segment contains permanent patient identifying and demographic information that, for the most part, is not likely to change frequently.

SEQ	LEN	DT	R/M	RP/#	TBL#	ELEMENT NAME
1	4	SI	RE			Set ID - PID
3	20	CX	R	Y	0203	Patient ID (Internal ID)
5	48	XPN	R	Y		Patient Name
6	48	XPN_M	RE	Y		Mother's Maiden Name
7	26	TS	R			Date/Time of Birth
8	1	IS	RE		0001	Sex
10	80	CE	R	Y	0005	Race
11	106	XAD	R	Y		Patient Address
13	40	XTN	RE			Phone number – home
19	16	ST	X			SSN Number – Patient
22	80	CE	RE	Y	0189	Ethnic Group
24	1	ID	RE		0136	Multiple Birth Indicator
25	2	NM	CE			Birth Order
29	26	TS	RE			Patient Death Date and Time
30	1	ID	RE		0136	Patient Death Indicator

Field Notes:

PID-1   Set ID – PID. This field contains the number that identifies the transaction. For the first occurrence of the segment, the sequence number shall be one, for the second occurrence, the sequence number shall be two, etc.

PID-3   Sub-components 1 (ID), 4 (Assigning Authority), and 5 (identifier type code) are required in the PID-3 field. When a Provider Organization is sending to NPDR, use the sending system's Chart Number or other identifier if available. When NPDR is sending to an outside system it will use the client's NPDR ID and chart number when it is available. Table 0363 contains valid values for sub-component 4, which, if left blank, will default to NEA. Table 0203 contains valid values for sub-component 5. If a valid SSN is sent in PID-3, NPDR will accept and store this SSN value. If a valid SSN is sent in both PID-3 and PID-19, NPDR will accept and store SSN value in PID-3. NPDR supports repetition of this field.

Note: Social security number is used for identification purposes only, and is not displayed in screens or distributed to Provider Organizations. Support of PID-19 is for backwards compatibility only. NPDR does not require inclusion of hyphens in the SSN. The following is an example of submitting the client's SSN in PID-3:

```
PID|||158465926^^^NEA^SS^^^^^^|
```

PID-5   See the XPN data type. Last name and first name are required in the first two components. If the Name Type Code component is included, use L-Legal *NOTE: If client does not have a first name,* **NO FIRST NAME** *must be entered.* NPDR does not support repetition of this field.

PID-6   See the XPN_M data type. In this context, where the mother's name is used for client identification, NPDR uses only last name and first name. A mother's legal name might also appear in the context of an NK1 segment. NPDR does not support repetition of this field.

PID-7   Give the year, month, and day of birth (YYYYMMDD). NPDR ignores any time component.

PID-8   See Table 0001. Use F, M, or U.

PID-10 See Table 0005. NPDR stores and writes "Unknown" values as null. NPDR does not accept Hispanic or Latino as a race option. Submit it in the Ethnic Group PID-22. NPDR does not support repetition of this field.

PID-11 See the XAD data type. NPDR does not support repetition of this field. Send the patient's primary address and county of residence in this field. NPDR will also attempt to populate city, county, and state if a Nebraska ZIP Code is sent. See User Table 0289 for a list of counties.

PID-13 See the XTN data type. Version 2.4 includes the support of the N, X, B and C sequences. NPDR does not support repetition of this field. If PRN is specified in component 2 (telecommunication use code (ID) from table 0201) NPDR will use the 6th 7th 8th and 9th components for specification of area code, phone number, extension and text, respectively. Otherwise, NPDR will assume that the phone number is specified in the first component in the [NNN] [(999)]999-9999[X99999][B99999][C any text] format

PID-19 NOTE: Social security number is now collected in the PID-3 segment.

PID-22 See Table 0189. NPDR stores and writes "Unknown" values as null. NPDR supports repetition of this field.

PID-24 Use **Y** to indicate that the client was born in a multiple birth event (twins, triplets, etc.).

PID-25 Relevant when client was born in a multiple birth event (twins, triplets, etc.). Use 1 for the first born, 2 for the second, etc. This field is useful in matching client data to existing records.

PID-29 The date of death, if client is deceased. Give the year, month, and day (YYYYMMDD). NPDR ignores any time component. If a death date is sent, then the Patient Registry Status in PD1-16 must indicate a value of "P" for permanently inactive/deceased.

PID-30 Patient Death Indicator. Indicates whether the patient is deceased. Refer to HL7 Table 0136 – Yes/No Indicator for valid values.

   Y – the patient is deceased

   N – the patient is not deceased

   Empty – status is undetermined.

   If Y is submitted in PID-30 field, PID-29 field is required.

PD1

   The PD1 carries patient additional demographic information that is likely to change.

SEQ	LEN	DT	R/M	RP/#	TBL#	ELEMENT NAME
11	80	CE	RE		0215	Publicity Code
12	1	ID	RE		0136	Protection Indicator
13	8	DT	CE			Protection Indicator effective date
16	1	IS	RE		0441	Patient registry status
17	8	DT	CE			Patient registry status effective date
18	8	DT	CE			Publicity Code effective date

Field Notes:

PD1-11 Controls whether recall/reminder notices are sent. NPDR will recognize "01" to indicate no recall/reminder notices or "02" recall/reminder notices any method. If values 03, 04, 05, 06, 07 are submitted NPDR will treat them as 02. If values 08, 09, 10, 11, 12 are submitted, NPDR will treat them as 01. NPDR should send actual values in database via outbound DX, so that future interstate DX partners supporting those values have accurate information to work with.

PD1-12 Controls visibility of records to other organizations. Indicates whether or not consent has been given (or assumed) for record sharing.

   Y – Protect access to data. Do not allow sharing of information data.

   N – Do not protect access to the data. Allow sharing of immunization data.

   <empty>

   Null or other values in this field will default to a value of 'N'.

   Note: Nebraska is an opt-out state. By default, this segment, if submitted, would be populated with a value of 'N'. Y will store as unknown.

PD1-13 Effective date for protection indicator reported in PD1-12. Format is YYYYMMDD.

PD1-16 Identifies the registry status of the patient. See table 0441. If a code of P is specified, the PID-29 segment must be filled in with Client Death Date or record will be rejected. If a code of P is specified, the PID-30 segment defaults to Y, and client death indicator is set to Y.

PD1-17 Effective date for registry status reported in PD1-16. Format is YYYYMMDD. If PD1-16 Patient Registry status exists, an organization must value this field.

PD1-18 Effective date for publicity code reported in PD1-11. Format is YYYYMMDD. If PD1-11 Publicity Code exists, an organization must value this field.

NK1

The NK1 segment contains information about the patient's other related parties. Any associated parties may be identified. Utilizing *NK1-1-set ID*, multiple NK1 segments can be sent to patient accounts.

SEQ	LEN	DT	R/M	RP/#	TBL#	ELEMENT NAME
1	4	SI	R			Set ID - NK1
2	48	XPN	R		0200	Name
3	60	CE	R		0063	Relationship
4	106	XAD	RE		0190	Address
5	40	XTN	RE			Phone Number

Field Notes:

NK1-1 This field contains the number that identifies the transaction. Sequential numbers. Use "1" for the first NK1 within the message, "2" for the second, and so forth (default to 1 if left blank). Although this field is required by HL7, NPDR will ignore its value, and there is no requirement that the record for the same responsible person keep the same sequence number across multiple messages, in the case that information from the same record is transmitted more than once.

NK1-2 Name of the responsible person who cares for the client. See the XPN data type. NPDR does not support repetition of this field. Refer to HL7 Table 200 – Name Type for valid values.

NK1-3 Relationship of the responsible person to the client. See data type CE and Table 0063 in the HL7 tables. Use the first three components of the CE data type, for example |MTH^Mother^HL70063|.

NK1-4 Responsible person's mailing address. See the XAD data type. NPDR does not support repetition of this field. Refer to HL7 Table 190 – Address type for valid values. Note: **The patient's primary address should be sent in PID-11.**

NK1-5 Responsible person's phone number. NPDR does not support repetition of this field. Refer to HL7 Table 0201 – Telecommunication Use Code, and HL7 Table 0202 – Telecommunication Equipment Type for valid values. If PRN is specified in component 2 (telecommunication use code (ID) from table 0201) NPDR will use the 6th 7th 8th and 9th components for specification of area code, phone number, extension and text, respectively. Otherwise, NPDR will assume that the phone number is specified in the first component in the [NNN] [(999)]999-9999[X99999][B99999][C any text] format. The patient's primary phone number should be sent in PID-13.

PV1

The PV1 segment is used to send visit-specific information.

The primary use in immunization messages in previous releases was to carry information about the client's eligibility status. This is now recorded at the immunization event (dose administered) level. Use of this segment for the purpose of reporting client eligibility for a funding program at the visit level is not supported for HL7 2.5.1.

SEQ	LEN	DT	R/M	RP/#	TBL#	ELEMENT NAME
2	1	IS	R		0004	Patient Class
20	50	FC	M	Y	0064	Financial Class

Field Notes:

PV1-2 See table 0004. NPDR will store and write a value of "R" (recurring patient) for this field.

PV1-20 See table 0064. This field has been replaced with OBX-5 in HL7 2.5.1.

OBX

The Observation/Result Segment is used to transmit an observation.

1. **OBX Segment for Symptoms**

SEQ	LEN	DT	R/M	RP/#	TBL#	ELEMENT NAME	NPDR Value
1	4	SI	R			Set ID – OBX	
2	2	ID	RE		0125	Value Type	CE
3	250	CE	R			Observation Identifier	OBX-3 as 56831-1^Problem associated signs and symptoms^LN
4	20	ST	O			Observation Sub-ID	
5	99999	Varies	R			Observation Value	Symptom code
6	250	CE	O			Units	
11	1	ID	R		0085	Observation Result Status	F
14	26	TS	R			Date/Time of the Observation	

NPDR Acceptable LOINC Cde (OBX-3)

LOINC Code	Description
56831-1	Problem associated signs and symptoms
52417-3	Medication Identifier
82777-4	Frequency Prescribed
82774-1	Quantity Prescribed
82776-6	Days' Supply Prescribed
73709-8	Pharmacy Prescription request
29300-1	Procedure

Field Notes:

OBX-1 Sequential numbers. Use "1" for the first OBX within the message, "2" for the second, and so forth.

OBX-2 This field contains the data type which defines the format of the observation value in OBX-5. NPDR will accept values of CE, TS, NM and ST for Coded Entry, Timestamp, Number and String respectively, depending on what is sent in OBX-5.
Use CE for symptoms in this field.

OBX-3 This field contains the observation's unique identifier. Organizations send Logical Identifier Name and LOINC Codes. The Name of Coding System in the third component must be LN for LOINC, first component and second component must report the following:
- **56831-1 Problem associated signs and symptoms**, use 56831-1 in this field and enter a Problem associated signs and symptoms (SCT or NPDR001) in OBX-5.

OBX-5 Problem associated signs and symptoms (SCT or NPDR001).

OBX-11 Required for HL7. Use "F" for NPDR.

OBX-14 This field contains date/time of the observation. The observation's date in YYYYMMDD format. NPDR ignores any time component.

NPDR Symptom Table (OBX-5)

Symptom	NPDR code	SCT Code	Notes
Resting tremor	RTR	25082004	
Tremor	TRM	26079004	
Shaking	SHK	49049000	Palsy
Jerking movements	JRK	17450006	
Trembling	TRB	718103001	Chin
Bradykinesia	BRK	399317006	
Slowness	SLW	230332007	Dopa responsive dystonia
Slow movements	SLM		
Cogwheel rigidity	COG	55630000	
Rigidity	RIG	16046003	
Stiffness	STF		
Tightness	TIG		
Postural instability	PST		
Falling	FLL	193462001	Fragmented sleep
Loss of balance	LOB	29831004	Remberg sign positive, or 371631005 panic disorder
Difficulty in maintaining balance	BAL		
Unstable gait	UGT	394616008	
Stumbling	STM		
Unsteadiness	USD		
Asymmetry, at onset	AAO		
More difficulty moving one side of the body than the other	MOV		
Asymmetry, ever (only if Asymmetry at onset is not available)	AEV		
Dysfunction (tremor, bradykinesia or rigidity) more pronounced on one side of body than the other	DYS		
Hallucinations/Delusions	HAL		

2. **OBX Segment for Additional Questions**

SEQ	LEN	DT	R/M	RP/#	TBL#	ELEMENT NAME	NPDR Value
1	4	SI	R			Set ID – OBX	
2	2	ID	RE		0125	Value Type	CE
3	250	CE	R			Observation Identifier	Q01^question 1^NPDR002
4	20	ST	O			Observation Sub-ID	
5	99999	Varies	R	Y		Observation Value	Answer
6	250	CE	RE			Units	
11	1	ID	R		0085	Observation Result Status	F
14	26	TS	RE			Date/Time of the Observation	
23	567	XON	RE			Performing Organization Name	NPDR will not validate this field. Will use OBX-8 for organization if OBX-3 is current clinician

Field Notes:

OBX-1 Sequential numbers. Use "1" for the first OBX within the message, "2" for the second, and so forth.

OBX-2 This field contains the data type which defines the format of the observation value in OBX-5. NPDR will accept values of CE, TS, NM and ST for Coded Entry, Timestamp, Number and String respectively, depending on what is actually sent in OBX-5.

OBX-3 This field contains the observation's unique identifier. Organizations send Logical Identifier Name and LOINC Codes. The Name of Coding System in the third component must be NPDR002, first component and second component must report the following:
- Use code Q01 to Q23 in this field and enter an Answer in OBX-5.

OBX-5 Answer. Accept 'Y' or 'N' in this field when OBX-3 is
- Use ST for String Data when OBX-3 is Q01 to Q04, Q06, Q08 to Q14, Q18 to Q20, and 'Y' or 'N' in OBX-5.
- Use NM for Numeric Data when OBX-3 is Q05, or Q07, and number in OBX-5.
- Use ST for String Data when OBX-3 is Q15, and occupation in OBX-5, maximum length is 30 characters.
- Use XCN for Current Clinician Data when OBX-3 is Q16, and clinician in OBX-5. Refer to XCN data type.
- Use CE for Coded Element Data when OBX-3 is Q21, Q22, and Q23, and NPDR code in OBX-5.

OBX-11 Required for HL7. Use "F" for NPDR.

OBX-14 This field contains date/time of the observation. The observation's date in YYYYMMDD format. NPDR ignores any time component. When year is prior to 1950 for Q21, Q22, and Q23, NPDR will default to <1950.

NPDR Question Table (OBX-3)

Additional Question	NPDR code	LOINC Code	Notes
Have you ever exposed to pesticides?	Q01		Y/N
Well water?	Q02		Y/N
If you did drink well water, was it always filtered?	Q03		Y/N
Coffee (1 cup or more per week)?	Q04		Y/N
If yes, how many cups per day?	Q05		Numeric
Cigarettes?	Q06		Y/N
If yes, how many packs per year?	Q07		Numeric
Milk (1 day or more per week)?	Q08		Y/N
NSAIDs (taken 1 day or more per week)?	Q09		Y/N
Anti-oxidants (taken 1 day or more per week)?	Q10		Y/N
Have you exercised more than one day per week over the past 10 years?	Q11		Y/N
Have you acted out physically while sleeping in the last 10 years (yelling, punching, falling out of bed, etc.)?	Q12		Y/N
Have you had a colonoscopy in the last 30 years?	Q13		Y/N
Have you ever exhibited impulsive behaviors, such as excessive shopping or gambling, Internet or sex addiction, etc.)	Q14		Y/N
Occupation	Q15		Text
Current Clinician	Q16		Clinician, organization, and Starting Date
Current Clinician Starting Date	Q17		
Have you ever had a traumatic brain injury (TBI)?	Q18		45664-0 LOINC Year and Cause Y/N
Have you ever sustained a concussion?	Q19		Y/N
Do you have any family members who had/have PD?	Q20		Y/N
TBI Cause	Q21		Cause and year
Concussion Sport Related	Q22		Sport and year
Family member relationship	Q23		Relationship and year

Acceptable values in OBX-5.1 when OBX-3.1 is Q21 TBI Cause:

NPDRTBI Cause Code	Description
MOT	Motor vehicle accident
FLL	Fall
MET	Metabolic disorder
DIS	Disease-related

Acceptable values in OBX-5.1 when OBX-3.1 is Q22 Concussion sport related:

NPDRSPORT Code	Description
FTB	Football
BSK	Basketball
BAS	Baseball/Softball
SOC	Soccer
HKY	Hockey
RGB	Rugby
LCR	Lacrosse
BOX	Boxing/Martial Arts
SWM	Swimming
TAF	Running/Track & field
HRS	Horse riding/polo
CYC	Cycling
OTH	Other sport
No	No sport related

Acceptable values in OBX-5.1 when OBX-3.1 is Q23 Family member relationship:

NPDRFAM Code	Description
FTH	Father
MTH	Mother
SIS	Sister
BRO	Brother
PGF	Paternal Grandfather
PGM	Paternal Grandmother
MGF	Maternal Grandfather
MGM	Maternal Grandmother
PGGF	Paternal Great Grandfather
PGGM	Paternal Great Grandmother
MGGF	Maternal Great Grandfather
MGGM	Maternal Great Grandmother
PU	Paternal Uncle
PA	Paternal Aunt
MU	Maternal Uncle
MA	Maternal Aunt
MC	Maternal Cousin
PC	Paternal Cousin

3. **OBX Segment for Medication History**

SEQ	LEN	DT	R/M	RP/#	TBL#	ELEMENT NAME	NPDR Value
1	4	SI	R			Set ID – OBX	
2	2	ID	RE		0125	Value Type	CE
3	250	CE	R			Observation Identifier	52417-3^Medication Identifier^LN
4	20	ST	RE			Observation Sub-ID	Required for medication related OBX
5	99999	Varies	R			Observation Value	0007-4890-20^Requip^NDC
6	250	CE	RE			Units	
11	1	ID	R		0085	Observation Result Status	F
14	26	TS	RE			Date/Time of the Observation	
16	250	XCN	RE	Y		Responsible Observer	Required for medication

Field Notes:

OBX-1   Sequential numbers. Use "1" for the first OBX within the message, "2" for the second, and so forth.

OBX-2   This field contains the data type which defines the format of the observation value in OBX-5. NPDR will accept values of CE, TS, NM and ST for Coded Entry, Timestamp, Number and String respectively, depending on what is actually sent in OBX-5.
Use CE for symptoms in this field.

OBX-3   This field contains the observation's unique identifier. Organizations send Logical Identifier Name and LOINC Codes. The Name of Coding System in the third component must be LN for LOINC, First component and second component must report the following:
- **52417-3 Medication Identifier**, use 52417-3 in OBX-3.1 and enter a Medication (10-digit NDC) in OBX-5, use first component for NDC number, second component for medication name, third component for 'NDC' in OBX-5. For example: 0007-4890-20^Requip^NDC
- **82777-4 Frequency Prescribed**, use 82777-4 in OBX-3.1 and enter a Medication frequency in OBX-5.
- **82774-1 Quantity Prescribed**, use 82774-1 in OBX-3.1and enter a Medication quantity in OBX-5.
- **82776-6 Days' Supply Prescribed**, use 82776-6 in OBX-3.1 and enter a Medication days' supply in OBX-5.
- **73709-8 Pharmacy Prescription request**, use 73709-8 in OBX-3.1 and enter a pharmacy in OBX-5, use first component for pharmacy NPI number, second component for pharmacy name, third component for 'NPI' in OBX-5. For example: NPI0000001^pharmacy name1^NPI
-

OBX-4   This field contains same Observation Sub-ID number for the medication. Each medication information grouped by the same number in OBX-4.

OBX-5   This field contains information for the Medication according to the LOINC code in OBX-3.1.
For example: 0007-4890-20^Requip^NDC

OBX-6   This field contains frequency unit if LOINC code 82777-4 in OBX-3.1. Use first component for Frequency Unit Code, second component for unit description, third component for 'UCUM'.

Acceptable NPDR Frequency Unit code:

Acceptable Code	Description
HR	HR for Hour
DY	DY for Day
WK	WK for Week
MO	MO for Month
YR	YR for Year

Acceptable UCUM Frequency Unit code:

Acceptable Code	Description
/h	HR for Hour
/d	DY for Day
/wk	WK for Week
/mo	MO for Month
/a	YR for Year

OBX-11 Required for HL7. Use "F" for NPDR.

OBX-14 This field contains date/time of the observation. The observation's date in YYYYMMDD format. NPDR ignores any time component.

OBX-16 This field contains the responsible observer. The clinician who prescribe the medication. Refer to XCN data type.

Example for medication in OBX:
OBX|9|CE|52417-3^Medication Identifier^LN|2|0007-4890-20^Requip^NDC||||||F|||20190401|2|NPI0001^last name^first name^^^^^IRPH^^^^^NPI|||||||IRPH
OBX|10|NM|82777-4^Frequency Prescribed^LN|2|2|DY^per day^UCUM|||||F
OBX|11|NM|82774-1^Quantity Prescribed^LN|2|30||||||F|
OBX|12|NM|82776-6^Days' Supply Prescribed^LN|2|7||||||F|
OBX|13|CE|73709-8^Pharmacy Prescription request^LN|2|NPI0001^pharmacy name1^NPI||||||F|

4. **OBX Segment for Procedure/Treatment**

SEQ	LEN	DT	R/M	RP/#	TBL#	ELEMENT NAME	NPDR Value
1	4	SI	R			Set ID – OBX	
2	2	ID	RE		0125	Value Type	CE
3	250	CE	R			Observation Identifier	29300-1^Procedure^LN
4	20	ST	O			Observation Sub-ID	
5	99999	Varies	R			Observation Value	61850^Twist drill or burr hole(s) for implantation of neurostimulator electrodes, cortical^CPT
6	250	CE	O			Units	
11	1	ID	R		0085	Observation Result Status	F
14	26	TS	R			Date/Time of the Observation	
16	250	XCN	RE	Y		Responsible Observer	

Field Notes:
OBX-1   Sequential numbers. Use "1" for the first OBX within the message, "2" for the second, and so forth.

OBX-2   This field contains the data type which defines the format of the observation value in OBX-5. NPDR will accept values of CE, TS, NM and ST for Coded Entry, Timestamp, Number and String respectively, depending on what is actually sent in OBX-5.
Use CE for symptoms in this field.

OBX-3   This field contains the observation's unique identifier. Organizations send Logical Identifier Name and LOINC Codes. The Name of Coding System in the third component must be LN for LOINC, First component and second component must report the following:
- **29300-1 Procedure**, use 29300-1 in this field and enter a Procedure code (CPT) in OBX-5.

OBX-5   Procedure or treatment code (CPT).

OBX-11 Required for HL7. Use "F" for NPDR.

OBX-14 This field contains date/time of the observation. The observation's date in YYYYMMDD format. NPDR ignores any time component.

OBX-16 This field contains the responsible observer. The clinician who ordered procedure/treatment. Refer to XCN data type.

Example for procedure in OBX:
OBX|1|CE|29300-1^Procedure^LN||61850^Twist drill or burr hole(s) for implantation of neurostimulator electrodes, cortical^CPT||||||F|||20190201||NPI0001^last name^first name^^^^^IRPH^^^^^NPI|||||||IRPH

Acceptable Procedure Code

Procedure Code	Description
61850	Twist drill or burr hole(s) for implantation of neurostimulator electrodes, cortical
61860	Craniectomy or craniotomy for implantation of neurostimulator electrodes, cerebral, cortical
61863	Twist drill, burr hole, craniotomy, or craniectomy with stereotactic implantation of neurostimulator electrode array in subcortical site (e.g., thalamus, globus pallidus, subthalamic nucleus, periventricular, periaqueductal gray) without use of intraoperative microelectrode recording; first array
61864	Each additional array (List separately in addition to primary procedure) N/A
61867	Twist drill, burr hole, craniotomy, or craniectomy with stereotactic implantation of neurostimulator electrode array in subcortical site (eg, thalamus, globus pallidus, subthalamic nucleus, periventricular, periaqueductal gray), with use of intraoperative microelectrode recording; first array
61868	Each additional array (List separately in addition to primary procedure) N/A
61870	Craniectomy for implantation of neurostimulator electrodes, cerebellar, cortical
61880	Revision or removal of intracranial neurostimulator electrodes
61885	Insertion or replacement of cranial neurostimulator pulse generator or receiver, direct or inductive coupling; with connection to a single electrode array
61886	Insertion or replacement of cranial neurostimulator pulse generator or receiver, direct or inductive coupling; with connection to 2 or more electrode arrays
61888	Revision or removal of cranial neurostimulator pulse generator or receiver

DG1

The DG1 segment contains patient diagnosis information. The DG1 segment is used to send multiple diagnoses.

SEQ	LEN	DT	R/M	RP/#	TBL#	ELEMENT NAME
1	4	SI	RE			Set ID – DG1
3	250	CE	RE		0051	Diagnosis Code – DG1
4	40	ST	O			Diagnosis Description
5	26	TS	R			Diagnosis Date/Time
6	2	IS	R		0052	Diagnosis Type
16	250	XCN	R	Y		Diagnosing Clinician
21	1	ID	RE		0206	Diagnosis Action Code

Field Notes:

DG1-1 Sequence number. Use "1" for the first DG1 within the message, "2" for the second, and so forth.

DG1-3 Diagnosis Coding Method. This field contains the diagnosis code assigned to this diagnosis. Refer to User-defined Table 0051 - Diagnosis Code for suggested values. This field is a CE data type for compatibility with clinical and ancillary systems. The Name of Coding System in the third component must be I10 (ICD-10), First component and second component must report the following:
- G20 – Parkinson's Disease
- A81.00 – Prion Disease (also Creutzfeldt-Jakob Disease)
- F03.90 – Dementia, Unspecified
- G12.20 – Motor Neuron Disease, Unspecified
- G12.21 – Amyotrophic Lateral Sclerosis (ALS)
- G10 – Huntington's Disease
- G21 – Secondary Parkinsonism

- G21.4 – Vascular Parkinsonism
- G23.1 – Progressive Supranuclear Palsy
- G23.2 – Striatonigral Degeneration
- G25 – Essential Tremor
- G25.2 – Dystonic Tremor
- G25.81 – Restless Legs Syndrome
- G30 – Alzheimer's Disease
- G31.09 – Frontotemporal Dementia
- G31.83 – Diffuse Lewy Body Disease
- G31.85 – Corticobasal Degeneration
- G35 – Multiple Sclerosis
- G40.909 – Epilepsy, Unspecified
- G47.52 – REM Sleep Behavior Disorder
- G80 – Cerebral Palsy
- G90.3 – Multiple System Atrophy
- G91.2 – Normal Pressure Hydrocephalus (NPH)
- I95.1 – Orthostatic Hypotension
- R25.1 – Tremor (unspecified or chronic)
- R46.4 – Slowness

DG1-4   Diagnosis Description contains a description that best describes the diagnosis.

DG1-5   This field contains the date/time that the diagnosis was determined.

DG1-6   This field contains the diagnosis type:
- 1 – Confirmed PD
- 2 – Confirmed Ruled Out
- 3 – Pending
- 4 – Lost to Follow-up
- <empty>

DG1-16 This field contains the individual responsible for generating the diagnosis information. Multiple names and identifiers for the same person may be sent in this field, not multiple diagnosing clinicians. The legal name is assumed to be in the first repetition. When the legal name is not sent, a repeat delimiter must be sent first for the first repetition.
- DG1-16.1 for Clinician Identifier.
- DG1-16.2 for Clinician Last Name.
- DG1-16.3 for Clinician First Name.
- DG1-16.7 for Clinician Suffix.
- DG1-16.10, Always default to Legal Name.
- DG1-16.13 for Identifier Type Code. Acceptable value: NPI, SL, NEA. NPI should be included in the first repetition.

DG1-21 This field defines the action to be taken for this diagnosis. Refer to HL7 Table 0206, acceptable values are:
- A – Add/Insert
- D - Delete
- U – Update
- <empty>

Segments in ACK^A28 and ACK^A31

ACK
Acknowledgment Messages (with Errors)
ACK messages are generated for message rejections and for informational error messages. Four conditions that result in entire message rejection are:
1. Sequencing (i.e. a PID segment must follow an MSH segment).
2. Required segment missing.

3. Required field missing from the [1..1] must have exactly one occurrence segment (i.e. a blank MSH-9 field, MSH-9 Message Type is a required field in required segment, without valid data, message cannot be processed).
4. Required field contains invalid data from the must have exactly one occurrence segment.

An ACK is also generated when an informational error message has occurred, but it has not resulted in message rejection (i.e. NK1 segment contains no last name). In this case, the segment is ignored but the remainder of the message is processed. An ACK message is generated with a message informing the sender of the problem. The error message in this case would NOT include "Message Rejected". The ACK contains the MSH, MSA, and ERR segments.

The MSH segment is generated according to normal HL7 processing guidelines. The MSA and ERR segments are detailed below:

MSA

Message Acknowledgment Segment

SEQ	LEN	DT	R/O	RP/#	TBL#	ELEMENT NAME
1	2	ID	R		0008	Acknowledgment code
2	20	ST	R			Message control ID
3	80	ST	O			Text message
4	15	NM	O			Expected sequence number
5	1	ID	O		0102	Delayed acknowledgment type
6	100	CE	O		0357	Error condition

Field Notes:

MSA-1 The acknowledgment code indicates whether the message was accepted, rejected, error, etc…This is a required field. NPDR generates an "AR" for messages resulting in rejection errors. An "AE" is generated for informational errors. An "AA" is generated for processed normally.
Note: For backwards compatibility, NPDR generates an "AR" for all rejections, including **but not limited to**:
-        Unsupported Message Type
-        Unsupported Event Code
-        Unsupported Processing ID
-        Unable to process for reasons unrelated to format or content.
MSA-2 The message control ID is the unique ID that is sent by the sending system. This is a required field. It allows the sending system to associate each message with a response. In a response, this will be the same as the control ID that was sent in MSH-10 by the sending system.
MSA-3 This optional field further describes an error condition. When a message has been rejected, NPDR generates "Message Rejection" as the first portion of the text describing the error message. Informational messages will not contain "Message Rejection".
MSA-4 This optional numeric field is used in the sequence number protocol. NPDR does not generate this field.
MSA-5 Delayed Acknowledgement type. NPDR does not generate this field.
MSA-6 Error Condition. Refer to HL7 table 0357 for possible values.

ERR

The ERR segment is used to add error comments to acknowledgment messages.

Note: ERR-1 field is not supported in Version 2.5.1.

SEQ	LEN	DT	R/M	RP/#	TBL#	ELEMENT NAME
1			X			Not supported for Version 2.5 and above.
2	18	ERL	RE			Error Location
3	705	CWE	R	Y	0357	HL7 Error Code
4		ID	R		0516	Severity
5		CWE	RE		0533	Application Error Code
8		TX	RE			User Message

Field Notes:
ERR-2   Error Location. Identifies the location in a message related to the identified error, warning or message. Each error will have an ERR, so no repeats are allowed on this field. This field may be left empty if location is unable to be parsed.
ERR-3   HL7 Error Code. Identifies the HL7 error code. Refer to HL7 Table 0357 – Message Error Condition Codes for valid values.

ERR-4   Identifies the severity of an application error. The Severity code indicates if the system sending the ACK or RSP (with error) is reporting an error that caused significant error loss. Refer to HL7 Table 0516.

ERR-5   Application specific code identifying the specific error that occurred. Refer to User-defined Table 0533 for appropriate values. Segment 1 (identifier) is required.

ERR-8   Error Message. This optional field further describes an error condition in HL7 2.5.1 ACK message. When a message has been rejected, NPDR generates "Message Rejection" as the first portion of the test describing the error message. Informational messages will not contain "Message Rejection".

This concludes real-time processing.

Real-time Processing

SOAP Web Services –Automation of data exchange is worked on only after a thorough testing of files by the submitter. Once this is completed, instructions will be provided by NPDR data exchange staff.

The following section outlines the various message types that are sent in real-time files.

Real-time files that provider organizations send to the NPDR can contain any of the following message types.

Real-time Process Message Types

ADT^A28^ADT_A05

    Unsolicited Update Patient Administration

MSH	Message Header
[EVN]	
PID	Patient Identification
[PD1]	Patient Additional Demographic
[{NK1}]	Next of Kin / Associated Parties
[PV1]	Patient Visit – Additional Info.
[{OBX}]	Observation/Result
[{DG1}]	Diagnosis Information

ADT^A31^ADT_A05

    Unsolicited Update Patient Administration

MSH	Message Header
[EVN]	
PID	Patient Identification
[PD1]	Patient Additional Demographic
[{NK1}]	Next of Kin / Associated Parties
[PV1]	Patient Visit – Additional Info.
[{OBX}]	Observation/Result
[{DG1}]	Diagnosis Information

This document outlines the rules/specifications needed to construct an HL7 message. These same rules must be applied for Real-time message processing. **Note: Batch Message Headers (i.e. FHS, BHS) and footers (i.e. FTS, BTS) are NOT required for Real-time processing.

Appendix A -- HL7 Data Types

The following descriptions of HL7 data types are excerpted or adapted from the HL7 standard. See the field notes within each segment definition above on how to use data types in particular fields. Some data types have complex definitions much of which does not apply to NPDR usage, and for these we omit much of the HL7 definition of the data type, referring instead to the field notes in the segment definitions.

CE -- Coded Element (most uses)

Components: <identifier (ST)> ^ <text (ST)> ^ <name of coding system (ST)> ^ <alternate identifier (ST)> ^ <alternate text (ST)> ^ <name of alternate coding system (ST)>

Example:

|F-11380^CREATININE^I9^2148-5^CREATININE^LN|

This data type transmits codes and the text associated with the code. To allow all six components of a CE data type to be valued, the maximum length of this data type must be at least 60.

- **Identifier (ST)**

   Sequence of characters (the code) that uniquely identifies the item being referenced by the <text>. Different coding schemes will have different elements here.

- **Text (ST)**

   Name or description of the item in question. E.g., myocardial infarction or X-ray impression. Its data type is string (ST).

- **Name of Coding System (ST)**

   Each coding system is assigned a unique identifier. This component will serve to identify the coding scheme being used in the identifier component. The combination of the **identifier** and **name of coding system** components will be a unique code for a data item. Each system has a unique identifier. ASTM E1238-94, Diagnostic, procedure, observation, drug ID, and health outcomes coding systems are identified in the tables in Section 7.1.4 [of the full HL7 standard], "Coding schemes." Others may be added as needed. When an HL7 table is used for a CE data type, the *name of coding system* component is defined as *HL7nnnn* where *nnnn* is the HL7 table number.

- **Alternate Components**

   These three components are defined analogously to the above for the alternate or local coding system. If the Alternate Text component is absent, and the Alternate Identifier is present, the Alternate Text will be taken to be the same as the Text component. If the Alternate Coding System component is absent, it will be taken to mean the locally defined system.

Note:	The presence of two sets of equivalent codes in this data type is semantically different from a repetition of a CE-type field. With repetition, several distinct codes (with distinct meanings) may be transmitted.

Note:	For HL7-defined tables which have not been adopted from some existing standard, the third component, "name of coding system," is constructed by appending the table number to the string "HL7." Thus, the field *RXR-2-site*, is a CE data type which refers to HL7 table number 0163. Its "name of coding system" component is "HL70163".

CQ – Composite Quantity with Units

This data type carries a quantity and attendant units. Its primary use in here will be for indicating the maximum number of records to return in a query response.
Example:
   |10RD| indicates 10 records.

- **Quantity (NM)**

   Specifies the numeric quantity or amount of an entity.

- **Units (CE)**

   Specifies the units in which the quantity is expressed..

CWE – Coded with Exceptions

Components: <Identifier (ST)> ^ <text (ST) ^ <Name of Coding (ID)> ^ <Alternate Identifier (ST) ^ <Alternate Text (ST) ^ <Name of Alternate (ID)> ^ <Coding System Version ID (ST)> ^ <Alternate Coding System Version ID (ST)> ^ < Original Text (ST)>

Subcomponents of facility (HD): <namespace ID (IS)> & <universal ID (ST)> & <universal ID type (ID)>
Example:
From RXR: |C28161^IM^NCIT^IM^INTRAMUSCULAR^HL71062|

- **Identifier (ST)**

    Sequence of characters (the code) that uniquely identifies the item being referenced by the <text>. Different coding schemes will have different elements here.

- **Text (ST)**

    Name or description of the item in question. E.g., myocardial infarction or X-ray impression. Its data type is string (ST).

- **Name of Coding System (ST)**

    Each coding system is assigned a unique identifier. This component will serve to identify the coding scheme being used in the identifier component. The combination of the **identifier** and **name of coding system** components will be a unique code for a data item. Each system has a unique identifier. ASTM E1238-94, Diagnostic, procedure, observation, drug ID, and health outcomes coding systems are identified in the tables in Section 7.1.4 [of the full HL7 standard], "Coding schemes." Others may be added as needed. When an HL7 table is used for a CE data type, the **name of coding system** component is defined as **HL7nnnn** where **nnnn** is the HL7 table number.

CX – Extended Composite ID with Check Digit

NPDR uses this data type only for client identification in Patient Identification (PID) segments. See the field notes for values used for NPDR.

DT_D – Date with Precision to Day

This data type specifies the century and year with optional precision to month and day

DTM – Date/Time

The number of characters populated (excluding the time zone specification) specifies the precision.
Format: YYYY[MM[DD[HH[MM[SS[.S[S[S[S]]]]]]]]][+/-ZZZZ]

- Eight are used to specify a precision of "day."
- the first ten are used to specify a precision of "hour."
- the first twelve are used to specify a precision of "minute."
- the first fourteen are used to specify a precision of "second."
- the first sixteen are used to specify a precision of "one tenth of a second."
- the first nineteen are used to specify a precision of "one ten thousandths of a second.

When the time zone is not included, it is presumed to be the time zone of the sender.

Example: [199904] specifies April 1999.

Note that this date type will be constrained at the field level, depending on the use.

EI – Entity Identifier

The Entity Identifier (EI) data type defines an entity within a specific series.

The four EI components specify an entity in a series
<entity identifier (ST)>^<namespace ID (IS)>^<universal ID (ST)>^<universal ID type (ID)>
For example, |z31^CDCPHINVS| in MSH-21.

- **Entity Identifier (ST)**
    A unique identifier from a series of identifiers.

- **Namespace ID (IS)**
    A user-defined identifier that specifies the assigning authority responsible for the data.

- **Universal ID (ST)**

  The unique Object Identifier (OID) within the defined Universal ID Type. It must follow the Universal ID Type syntactic rules. If populated, this component should be an OID.

- **Universal ID Type (ID)**

  Controller of Universal ID deciphering. If a Universal ID exists, this element should be the value ISO.

ERL – Error Location

The Error Location (ERL) data type identifies exactly where an error occurred.
The six ERL components specify where an error occurred
^^<field position (NM)>^<field repetition (NM)>^<component number (NM)>^<sub-component number (NM)>
For example, |RXA^1^5^1^3|

- **Segment ID (ST)**

  The three-letter code that names the segment category.

- **Segment Sequence (NM)**

  Identifies the specific instance of the segment where the error occurred. These numbers use 1for the first instance, 2 for the second, and so forth.

- **Field Position (NM)**

  Determines the field number within the segment. These numbers use 1 for the first field, 2 for the second, and so forth. NPDR leaves the field number empty when referring to the entire segment as a whole.

- **Field Repetition (NM)**

  The first instance uses 1. If the Field Position is populated, then NPDR values the Field Repetition.

- **Component Number (NM)**

  Determines the component number within the field. These numbers use 1 for the first component, 2 for the second, and so forth. NPDR leaves the Component Number empty when referring to the entire field as a whole.

- **Sub-Component Number (NM)**

  Determines the Sub-Component number within the component. These numbers use 1 for the first component, 2 for the second, and so forth. NPDR leaves the Component Number empty when referring to the entire field as a whole.

FN – Family Name

This data type contains a person's family name (i.e. surname). Surname (ST) – This is the person's last name.

FT – Formatted Text (new)

Usage Note: The FT data type allows use of the formatting escape sequences documented in *HL7 Version 2.5.1, Chapter 2, Section 2.7.1 - Use of Escape Sequences in Text Fields.* In this implementation guide, the only allowed escape sequences are those allowed in *HL7 Version 2.5.1, Chapter 2, Section 2.7.4 - Special Characters.* These are the escape sequences for the message delimiters (i.e., |^&~\ ).

HD -- Hierarchic Designator

The Hierarchic Designator (HD) determines the organization or system responsible for managing or assigning a defined identifier set. NPDR uses this data type only to identify sender and receiver in Message Header (MSH) segments. See the field notes for values used for NPDR.
The three HL components establish the entity responsible for defined identifiers
<namespace ID (IS)>^<universal ID (ST)>^<universal ID type (ID)>

For example, |NPDR7.3.1|

ID -- Coded Values for HL7 Defined Tables

The value of such a field follows the formatting rules for a ST field except that it is drawn from a table of legal values. There shall be an HL7 table number associated with ID data types. Examples of ID fields include religion and sex. This data type

should be used only for HL7 tables. The reverse is not true, since in some circumstances it is more appropriate to use the CE data type for HL7 tables.

IS -- Coded Values for User Defined Tables

The value of such a field follows the formatting rules for a ST field except that it is drawn from a site-defined (or user-defined) table of legal values. There shall be an HL7 table number associated with IS data types. An example of an IS field is the *Event reason code* defined in Section 3.3.1.4 [of the full HL7 standard], "Event reason code." This data type should be used only for user-defined tables. The reverse is not true, since in some circumstances, it is more appropriate to use the CE data type for user-defined tables.

LA2 – Location with Address Variation 2

The Location with Address Variation 2 (LA2) specifies a location and its address.

The sixteen LA2 components specify a location
<point of care (IS)> ^ <room (IS)> ^ <bed (IS)> ^ <facility (HD)> ^ <location status (IS)> ^ <patient location type (IS)> ^ <building (IS)> ^ <floor (IS)> ^ < street address (ST)> ^ <other designation (ST)> ^ <city (ST)> ^ <state or province (ST)> ^ <zip or postal code (ST)> ^ <country (ID)> ^ <address type (ID)> ^ <other geographic designation (ST)>
For example, |^^^2345^^^^15^101 MAIN STREET^^METROPOLIS^NE|

MSG – Message Type

This field contains the message type, trigger event, and the message structure ID for the message in MSH-9 Message Type.

The three MSH components define the message type

<message code (ID)>^<trigger event (ID)>^<message structure (ID)>

For example, |ADT^A31^ADT_A05|

NM -- Numeric

A number represented as a series of ASCII numeric characters consisting of an optional leading sign (+ or -), the digits and an optional decimal point. In the absence of a sign, the number is assumed to be positive. If there is no decimal point the number is assumed to be an integer. Examples:

> |999|
>
> |-123.792|

Leading zeroes, or trailing zeroes after a decimal point, are not significant. For example, the following two values with different representations, "01.20" and "1.2", are identical. Except for the optional leading sign (+ or -) and the optional decimal point (.), no non-numeric ASCII characters are allowed. Thus, the value <12 should be encoded as a structured numeric (SN) (preferred) or as a string (ST) (allowed, but not preferred) data type.

PT – Processing Type

This data type indicates whether to process a message as defined in HL7 Application (level 7) Processing rules.

- Processing ID (ID)

  A value that defines whether the message is intended for a production, training, or debugging system. Refer to HL7 Table 0103 – Processing ID for valid values.

SAD – Street Address

The street address (SAD) specifies an entity's street address and associated details.

The three SAD components contain address details
<street or mailing address (ST)>^<street name (ST)>^<dwelling number (ST)>
For example, |747 ABERG^^Albany^NE^68352 |

- **Street or Mailing Address (ST)**

For a person or institution, states the first line of a street or mailing address.

SI -- Sequence ID

A non-negative integer in the form of a NM field. See the field notes in segments using this data type for specifications of SI fields.

ST -- String Data

String data is left justified with trailing blanks optional. Any displayable (printable) ASCII characters (hexadecimal values between 20 and 7E, inclusive, or ASCII decimal values between 32 and 126), except the defined delimiter characters. Example:

> |almost any data at all|

To include any HL7 delimiter character (except the segment terminator) within a string data field, use the appropriate HL7 escape sequence.

Usage note: the ST data type is intended for short strings (e.g., less than 200 characters). For longer strings the TX or FT data types should be used.

TS – Time Stamp

Format: YYYY[MM[DD[HHMM[SS[.S[S[S[S]]]]]]]][+/-ZZZZ]^<degree of precision>

Contains the exact time of an event, including the date and time. The date portion of a time stamp follows the rules of a date field and the time portion follows the rules of a time field. NPDR ignored any time component. Precision must be at least to the day.

The two TD components carry time and precision

<time (DTM)>^<degree of precision (ID)>

For example, |20010902|

TS_M – Time Stamp with Optional Precision to the Day and No Time Zone

Specifies a point in time. This data type requires a precision to the month. Precision to the day is optional.

TS_NZ – Time Stamp with Optional Precision to the Day and No Time Zone

Specifies a point in time. This data type requires a precision to the day. No Time zone is included. NPDR ignores any time component.

TS_Z – Time Stamp Requiring Time Zone

Specifies a point in time. This data type requires a precision to the second and requires that the time zone be included.

VID – Version Identifier

This specifies the HL7 version.

XAD – Extended Address

> Components: <street address (SAD)> ^ <other designation (ST)> ^ <city (ST)> ^ <state or province (ST)> ^ <zip or postal code(ST)> ^ < country (ID)> ^ < address type (ID)> ^ <other geographic designation (ST)>^ <county/parish code (IS)> ^ <census tract (IS)> ^ <address representation code (ID)>

> Example:

> > |1234 Easy St.^Ste. 123^San Francisco^CA^95123^USA^B^^SF^^|

- **Street Address (SAD)**

  The street or mailing address of a person or institution.

- **Other Designation (ST)**

  Second line of address. In general, it qualifies address. Examples: Suite 555 or Fourth Floor.

- **City (ST)**

    City address of a person or institution

- **State or Province (ST)**

    State or province should be represented by the official postal service codes for that country.

- **Zip or Postal Code (ST)**

    Zip or postal codes should be represented by the official codes for that country. In the US, the zip code takes the form 99999[-9999], while the Canadian postal code takes the form A9A-9A9.

- **Country (ID)**

    Defines the country of the address. See Table 0212.

- **Address Type (ID)**

    Address type is optional.

- **County/Parish Code (IS)**

    A code that represents the county in which the specified address resides. Refer to *user-defined table 0289 - County/parish*. When this component is used to represent the county (or parish), component 8 "other geographic designation" should not duplicate it (i.e., the use of "other geographic designation" to represent the county is allowed only for the purpose of backward compatibility, and should be discouraged in this and future versions of HL7).

XCN -- Extended Composite ID Number and Name for Persons

HL7 XCN Data Type for clinician

SEQ	LEN	DT	Usage in NPDR	TBL#	COMPONENT NAME
1	15	ST	R		ID Number
2	194	FN	RE		Family Name
3	30	ST	RE		Given Name
4	30	ST	O		Second and Further Given Names or Initials Thereof
5	20	ST	O		Suffix Acceptable values are: • APRN • DO • MD • PA • PA-C
6	20	ST	O		Prefix (e.g., DR)
7	5	IS	RE	360	Degree (e.g., MD)
8	4	IS	RE	297	Source Table Note: Include Organization Code for NPDR
9	227	HD		363	Assigning Authority
10	1	ID	RE	200	Name Type Code, always set to L for clinician name
11	1	ST			Identifier Check Digit
12	3	ID		61	Check Digit Scheme
13	5	ID	RE	203	Identifier Type Code Acceptable values are: • NPI • SL (Nebraska License Number) • NEA
14	227	HD			Assigning Facility
15	1	ID		465	Name Representation Code

16	483	CE		448	Name Context
17	53	DR			Name Validity Range
18	1	ID		444	Name Assembly Order
19	26	TS			Effective Date
20	26	TS			Expiration Date
21	199	ST			Professional Suffix
22	705	CWE			Assigning Jurisdiction
23	705	CWE			Assigning Agency or Department

XPN -- Extended Person Name

Components: <family name (ST)> & <last name prefix (ST)> ^ <given name (ST)> ^ <middle initial or name (ST)> ^ <suffix (e.g., JR or III) (ST)> ^ <prefix (e.g., DR) (ST)> ^ <degree (e.g., MD) (ST)> ^ <name type code (ID) > ^ <name representation code (ID)>

Example:

|Smith&St^John^J^III^DR^PHD^L|

- **Family Name (FN)**

    Usually the last name.

    Note: The Given Name (first name), Family Name (last name), and Second and Further Given Names or Initials Thereof cannot contain special characters. NPDR accepts letters; spaces; and period., hyphen -, and apostrophe ' characters.

- **Given Name (ST)**

    Usually the first name.

- **Second and Further Given Names or Initials Thereof (ST)**

    Usually the middle name or initial, if available. Multiple Second and Further Given Names or Initials Thereof may be included by separating them with spaces.

- **Name Type Code (ID)**

    Given information like maiden name, legal name, etc. If the field is empty, NPDR defaults to L for Legal Name.

- **Suffix (ST)**

    Used to specify a name suffix (e.g., Jr. or III).

- **Prefix (ST)**

    Used to specify a name prefix (e.g., Dr.).

- **Degree (ST)**

    Used to specify an educational degree (e.g., MD).

- **Name Type Code (ID)**

    A code that represents the type of name. Refer to *HL7 table 0200 - Name type* for valid values.

Table 0200 - Name type

Value	Description
A	Alias Name
L	Legal Name
D	Display Name
M	Maiden Name
C	Adopted Name

Note: The legal name is the same as the current married name.

- **Name Representation Code (ID)**

    This component can be used when names are represented in ideographic or non-alphabetic systems. NPDR ignores this component.

XON – Extended Composite Name and ID Number and Name for Organizations

This data type identifies an organization using a unique id and name. The ID is associated with an entity such as an organization, which assigns the ID.

XPN_M – Extended Person Name – Maiden Name

This is used for representing a mother's maiden name

XTN – Extended Telecommunication Number

Extended Telecommunication Number

Components: [**N**NN] [(999)]999-9999 [X99999] [B99999] [C any text] ^ <telecommunication use code (ID)> ^ <telecommunication equipment type (ID)> ^ <email address (ST)> ^ <country code (NM)> ^ <area/city code (NM)> ^ <phone number (NM)> ^ <extension (NM)> ^ <any text (ST)>

Example:

(415)555-3210^ORN^FX^

- **[(999)] 999-9999 [X99999] [C any text]**

    Defined as the TN data type, except that the length of the country access code has been increased to three.

- **Telecommunication use code (ID)**

    A code that represents a specific use of a telecommunication number. Refer *to HL7 table 0201 - Telecommunication use code* for valid values.

    Table 0201 - Telecommunication use code

Value	Description
PRN	Primary Residence Number
ORN	Other Residence Number
WPN	Work Number
VHN	Vacation Home Number
ASN	Answering Service Number
EMR	Emergency Number
NET	Network (email) Address
BPN	Beeper Number

- **Telecommunication equipment type (ID)**

    A code that represents the type of telecommunication equipment. Refer *to HL7 table 0202 - Telecommunication equipment type* for valid values.

    Table 0202 - Telecommunication equipment type

Value	Description
PH	Telephone
FX	Fax
MD	Modem
CP	Cellular Phone
BP	Beeper
Internet	Internet Address: Use Only If Telecommunication Use Code Is NET
X.400	X.400 email address: Use Only If Telecommunication Use Code Is NET

Email address (ST)
Country code (NM)
Area/city code (NM)
Phone number (NM)
Extension (NM)
Any text (ST)

Appendix B -- HL7 Tables

The following tables give valid values for fields in the segments defined above, in the cases where the field definitions reference an HL7 table number. The tables are considered to be part of the HL7 standard.

Type	Table	Name	Value	Description
HL7	0001	**Sex**		
	0001		F	Female
	0001		M	Male
	0001		U	Unknown
HL7	0003	**Event Type**		
	0003		A31	ADT/ACK - Update patient information
	0003		K11	RSP- Response to vaccination query (Real-Time)
	0003		Q11	QBP - Query for vaccination record (Real-Time)
	0003		V04	VXU - Unsolicited vaccination record update
HL7	0004	**Patient class**		
	0004		R	Recurring
HL7	0005	**Race**		
	0005		1002-5	American Indian or Alaska Native
	0005		2028-9	Asian
	0005		2076-8	Native Hawaiian or Other Pacific Islander
	0005		2054-5	Black or African-American
	0005		2106-3	White
	0005		2131-1	Other Race
	0005		Null	Unknown
HL7	0008	**Acknowledgment Code**		
	0008		AA	Application Accept
	0008		AE	Application Error
	0008		AR	Application Reject
User	0063	**Relationship**		
	0063		ASC	Associate
	0063		BRO	Brother
	0063		CGV	Care giver
	0063		CHD	Child
	0063		DEP	Handicapped dependent
	0063		DOM	Life partner
	0063		EMC	Emergency contact
	0063		EME	Employee
	0063		EMR	Employer
	0063		EXF	Extended family
	0063		FCH	Foster Child
	0063		FND	Friend
	0063		FTH	Father
	0063		GCH	Grandchild
	0063		GRD	Guardian
	0063		GRP	Grandparent
	0063		MGR	Manager
	0063		MTH	Mother
	0063		NCH	Natural child
	0063		NON	None
	0063		OAD	Other adult
	0063		OTH	Other
	0063		OWN	Owner
	0063		PAR	Parent
	0063		SCH	Stepchild
	0063		SEL	Self
	0063		SIB	Sibling

Type	Table	Name	Value	Description
	0063		SIS	Sister
	0063		SPO	Spouse
	0063		TRA	Trainer
	0063		UNK	Unknown
	0063		WRD	Ward of court
HL7	0076	**Message Type**		
	0076		ACK	General acknowledgment message
	0076		ADT	ADT message
	0076		QBP	Query by parameter
	0076		RSP	Segment pattern response
	0076		VXU	Unsolicited vaccination record update
HL7	0103	**Processing ID**		
	0103		P	Production
HL7	0104	**Version ID**		
	0104		2.3.1	Release 2.3.1 1999
	0104		2.4	Release 2.4 2000
	0104		2.5.1	Release 2.5.1 April 2007
HL7	0125	**Constrained**		
	0125		CE	
	0125		NM	
	0125		ST	
	0125		DT	
	0125		ID	
	0125		TS	
HL7	0136	**Yes/No Indicator**		
	0136		Y	Yes
	0136		N	No
HL7	0155	**Accept/Application Acknowledgment Conditions**		
	0155		AL	Always
	0155		ER	Error/reject conditions only
	0155		NE	Never
HL7	0189	**Ethnic Group**		
	0189		2135-2	Hispanic
	0189		2186-5	Non-Hispanic
	0189		Null	Unknown
HL7	0190	**Address Type**		
	0190		C	Current or temporary
	0190		P	Permanent
	0190		M	Mailing
	0190		B	Firm/Business
	0190		O	Other
	0190		H	Home
	0190		N	Birth (nee)
	0190		F	Country of Origin
	0190		L	Legal Address
	0190		BDL	Birth delivery location [use for birth facility]
	0190		BR	Residence at birth [use for residence at birth]
	0190		RH	Registry home
	0190		BA	Bad address
HL7	0200	**Name Type**		
	0200		A	Alias name
	0200		L	Legal name

Type	Table	Name	Value	Description	
	0200		D	Display name	
	0200		M	Maiden name	
	0200		C	Adopted name	
	0200		B	Name at birth	
	0200		P	Name of partner/spouse	
	0200		U	Unspecified	
HL7	0201	**Telecommunication use code**			
	0201		PRN	Primary residence number	
	0201		ORN	Other residence number	
	0201		WPN	Work number	
	0201		VHN	Vacation home number	
	0201		ASN	Answering service number	
	0201		EMR	Emergency number	
	0201		NET	Network (e-mail) address	
	0201		BPN	Beeper number	
HL7	0202	**Telecommunication equipment type**			
	0202		PH	Telephone	
	0202		FX	Fax	
	0202		MD	Modem	
	0202		CP	Cellular phone	
	0202		BP	Beeper	
	0202		Internet	Internet address: Use only if telecommunication use code is NET.	
	0202		X.400	X.400 email address: Use only if telecommunication use code is NET.	
	0202		TDD	Telecommunication Device for the Deaf	
	0202		TTY	Teletypewriter	
User	0203	**Identifier Type**			
	0203		ANON	Anonymous identifier	
	0203		BR	Birth Registry Number	
	0203		DL	Driver's License Number	
	0203		HC	Health Card Number	
	0203		LR	Local Registry ID	
	0203		MA	Medicaid Number	
	0203		MC	Medicare Number	
	0203		MR	Medical Record Number	
	0203		MRT	Temporary Medical Record Number	
	0203		NH	National Health Plan Identifier	
	0203		NI	National Unique Individual Identifier	
	0203		PI	Patient Internal Identifier	
	0203		PN	Person Number	
	0203		PRN	Provider Number	
	0203		PT	Patient External Identifier	
	0203		RRI	Regional Registry ID	
	0203		SR	State Registry Identifier	
	0203		SS	Social Security Number	
	0203		WC	WIC Identifier	
User	0212	**Nationality**			
	0212		CA	Canada	
	0212		US	United States of America	
User	0289	**County/parish (Nebraska & some surrounding counties)**			
	0289	*Nebraska Counties*	NE001	Nebraska	Adams
	0289		NE003	Nebraska	Antelope
	0289		NE005	Nebraska	Arthur

Type	Table	Name	Value	Description	
	0289		NE007	Nebraska	Banner
	0289		NE009	Nebraska	Blaine
	0289		NE011	Nebraska	Boone
	0289		NE013	Nebraska	Box Butte
	0289		NE015	Nebraska	Boyd
	0289		NE017	Nebraska	Brown
	0289		NE019	Nebraska	Buffalo
	0289		NE021	Nebraska	Burt
	0289		NE023	Nebraska	Butler
	0289		NE025	Nebraska	Cass
	0289		NE027	Nebraska	Cedar
	0289		NE029	Nebraska	Chase
	0289		NE031	Nebraska	Cherry
	0289		NE033	Nebraska	Cheyenne
	0289		NE035	Nebraska	Clay
	0289		NE037	Nebraska	Colfax
	0289		NE039	Nebraska	Cuming
	0289		NE041	Nebraska	Custer
	0289		NE043	Nebraska	Dakota
	0289		NE045	Nebraska	Dawes
	0289		NE047	Nebraska	Dawson
	0289		NE049	Nebraska	Deuel
	0289		NE051	Nebraska	Dixon
	0289		NE053	Nebraska	Dodge
	0289		NE055	Nebraska	Douglas
	0289		NE057	Nebraska	Dundy
	0289		NE059	Nebraska	Fillmore
	0289		NE061	Nebraska	Franklin
	0289		NE063	Nebraska	Frontier
	0289		NE065	Nebraska	Furnas
	0289		NE067	Nebraska	Gage
	0289		NE069	Nebraska	Garden
	0289		NE071	Nebraska	Garfield
	0289		NE073	Nebraska	Gosper
	0289		NE075	Nebraska	Grant
	0289		NE077	Nebraska	Greeley
	0289		NE079	Nebraska	Hall
	0289		NE081	Nebraska	Hamilton
	0289		NE083	Nebraska	Harlan
	0289		NE085	Nebraska	Hayes
	0289		NE087	Nebraska	Hitchcock
	0289		NE089	Nebraska	Holt
	0289		NE091	Nebraska	Hooker
	0289		NE093	Nebraska	Howard
	0289		NE095	Nebraska	Jefferson
	0289		NE097	Nebraska	Johnson
	0289		NE099	Nebraska	Kearney
	0289		NE101	Nebraska	Keith
	0289		NE103	Nebraska	Keya Paha
	0289		NE105	Nebraska	Kimball
	0289		NE107	Nebraska	Knox
	0289		NE109	Nebraska	Lancaster
	0289		NE111	Nebraska	Lincoln
	0289		NE113	Nebraska	Logan
	0289		NE115	Nebraska	Loup

Type	Table	Name	Value	Description	
	0289		NE117	Nebraska	McPherson
	0289		NE119	Nebraska	Madison
	0289		NE121	Nebraska	Merrick
	0289		NE123	Nebraska	Morrill
	0289		NE125	Nebraska	Nance
	0289		NE127	Nebraska	Nemaha
	0289		NE129	Nebraska	Nuckolls
	0289		NE131	Nebraska	Otoe
	0289		NE133	Nebraska	Pawnee
	0289		NE135	Nebraska	Perkins
	0289		NE137	Nebraska	Phelps
	0289		NE139	Nebraska	Pierce
	0289		NE141	Nebraska	Platte
	0289		NE143	Nebraska	Polk
	0289		NE145	Nebraska	Red Willow
	0289		NE147	Nebraska	Richardson
	0289		NE149	Nebraska	Rock
	0289		NE151	Nebraska	Saline
	0289		NE153	Nebraska	Sarpy
	0289		NE155	Nebraska	Saunders
	0289		NE157	Nebraska	Scotts Bluff
	0289		NE159	Nebraska	Seward
	0289		NE161	Nebraska	Sheridan
	0289		NE163	Nebraska	Sherman
	0289		NE165	Nebraska	Sioux
	0289		NE167	Nebraska	Stanton
	0289		NE169	Nebraska	Thayer
	0289		NE171	Nebraska	Thomas
	0289		NE173	Nebraska	Thurston
	0289		NE175	Nebraska	Valley
	0289		NE177	Nebraska	Washington
	0289		NE179	Nebraska	Wayne
	0289		NE181	Nebraska	Webster
	0289		NE183	Nebraska	Wheeler
	0289		NE185	Nebraska	York
	0289	*Colorado Counties*	CO075	Colorado	Logan
	0289		CO095	Colorado	Phillips
	0289		CO115	Colorado	Sedgwick
	0289		CO123	Colorado	Weld
	0289		CO125	Colorado	Yuma
	0289	*Iowa Counties*	IA071	Iowa	Fremont
	0289		IA085	Iowa	Harrison
	0289		IA129	Iowa	Mills
	0289		IA133	Iowa	Monona
	0289		IA149	Iowa	Plymouth
	0289		IA155	Iowa	Pottawattamie
	0289		IA193	Iowa	Woodbury
	0289	*Kansas Counties*	KS013	Kansas	Brown
	0289		KS023	Kansas	Cheyenne
	0289		KS039	Kansas	Decatur
	0289		KS089	Kansas	Jewell
	0289		KS117	Kansas	Marshall
	0289		KS123	Kansas	Mitchell
	0289		KS131	Kansas	Nemaha
	0289		KS137	Kansas	Norton
	0289		KS147	Kansas	Phillips
	0289		KS153	Kansas	Rawlins

Type	Table	Name	Value	Description	
	0289		KS157	Kansas	Republic
	0289		KS183	Kansas	Smith
	0289		KS201	Kansas	Washington
	0289	*Missouri Counties*	MO005	Missouri	Atchison
	0289		MO087	Missouri	Holt
	0289	*South Dakota Counties*	SD007	South Dakota	Bennett
	0289		SD009	South Dakota	Bon Homme
	0289		SD023	South Dakota	Charles Mix
	0289		SD027	South Dakota	Clay
	0289		SD047	South Dakota	Fall River
	0289		SD053	South Dakota	Gregory
	0289		SD099	South Dakota	Minnehaha
	0289		SD113	South Dakota	Shannon
	0289		SD121	South Dakota	Todd
	0289		SD123	South Dakota	Tripp
	0289		SD135	South Dakota	Yankton
	0289	*Wyoming Counties*	WY015	Wyoming	Goshen
	0289		WY021	Wyoming	Laramie
	0289		WY025	Wyoming	Natrona
	0289		WY027	Wyoming	Niobrara
	0289		WY031	Wyoming	Platte
HL7	0322	**Completion status**			
	0322		CP	Complete	
	0322		RE	Refused	
	0322		NA	Not administered	
	0322		PA	Partially administered	
HL7	0323	**Action code**			
	0323		A	Add	
	0323		D	Delete	
	0323		U	Update	
HL7	0354	**Message Structure**			
	0354		ACK	ACK for all Trigger Events	
	0354		QBP_Q11	QBP for Q11 Trigger Event	
	0354		RSP_K11	RSP for K11 Trigger Event	
	0354		VXU_V04	VXU for V04 Trigger Event	
HL7	0357	**Message Error Condition Codes**			
	0357	*Error Status Codes*	100	Segment sequence error	
	0357		101	Required field missing	
	0357		102	Data type error	
	0357		103	Table value not found	
	0357	*Rejection Status Codes*	200	Unsupported message type	
	0357		201	Unsupported event type	
	0357		202	Unsupported processing ID	
	0357		203	Unsupported version ID	
	0357	*Status Code*	207	Application internal error	
User	0363	**Assigning Authority**			
	0363		AKA	Alaska	
	0363		ALA	Alabama	
	0363		ARA	Arkansas	
	0363		ASA	American Samoa	
	0363		AZA	Arizona	
	0363		BAA	New York City	
	0363		CAA	California	
	0363		CHA	Chicago	
	0363		COA	Colorado	
	0363		CTA	Connecticut	

Type	Table	Name	Value	Description
	0363		DCA	District of Columbia
	0363		DEA	Delaware
	0363		FLA	Florida
	0363		FMA	Fed States Micro
	0363		GAA	Georgia
	0363		GUA	Guam
	0363		HIA	Hawaii
	0363		IAA	Iowa
	0363		IDA	Idaho
	0363		ILA	Illinois
	0363		INA	Indiana
	0363		KSA	Kansas
	0363		KYA	Kentucky
	0363		LAA	Louisiana
	0363		MAA	Massachusetts
	0363		MDA	Maryland
	0363		MEA	Maine
	0363		MHA	Rep Mars Islands
	0363		MIA	Michigan
	0363		MNA	Minnesota
	0363		MOA	Missouri
	0363		MPA	No. Mariana Islands
	0363		MSA	Mississippi
	0363		MTA	Montana
	0363		NCA	North Carolina
	0363		NDA	North Dakota
	0363		NEA	Nebraska
	0363		NHA	New Hampshire
	0363		NJA	New Jersey
	0363		NMA	New Mexico
	0363		NVA	Nevada
	0363		NYA	New York State
	0363		OHA	Ohio
	0363		OKA	Oklahoma
	0363		ORA	Oregon
	0363		PAA	Pennsylvania
	0363		PHA	Philadelphia
	0363		PRA	Puerto Rico
	0363		RIA	Rhode Island
	0363		RPA	Republic Palau
	0363		SCA	South Carolina
	0363		SDA	South Dakota
	0363		TBA	San Antonio
	0363		THA	Houston
	0363		TNA	Tennessee
	0363		TXA	Texas
	0363		UTA	Utah
	0363		VAA	Virginia
	0363		VIA	Virgin Islands
	0363		VTA	Vermont
	0363		WAA	Washington
	0363		WIA	Wisconsin
	0363		WVA	West Virginia
	0363		WYA	Wyoming
User	0441	**Patient registry status**		

Type	Table	Name	Value	Description
	0441		A	Active
	0441		I	Inactive – unspecified (inactive or unknown)
	0441		L	Inactive – Lost to follow-up (cannot contact)
	0441		M	Inactive – No longer a patient (Moved or gone elsewhere, transferred)
	0441		P	Deceased (Permanently inactive, do not reactivate or add new entries to this record)
HL7	0516	**Error Severity**		
	0516		I	Information
	0516		W	Warning
	0516		E	Error
User	0533	**Application Error Code**		
	0533		1	Illogical Date error
	0533		2	Invalid Date
	0533		3	Illogical Value error
	0533		4	Invalid value
	0533		5	Table value not found
	0533		6	Required observation missing
NIP	NIP005	**Event Consequence**		
	NIP005		D	Patient Died
	NIP005		L	Life threatening illness
	NIP005		E	Required emergency room/doctor visit
	NIP005		H	Required hospitalization
	NIP005		P	Resulted in prolongation of hospitalization
	NIP005		J	Resulted in permanent disability

Appendix C -- HL7 Tables - NPDR

The following tables give valid values for fields in the segments defined above, in the cases where the field definitions reference an SCT or CPT code, these tables are considered to be part of the HL7 standard. Other tables designated as type User have values determined by NPDR.

	HL7 2.5.1 Coding System	HL7 2.5.1 Value	NPDR Code	Description
HL7	0396	**NPDR Symptoms Code**	NPDR001	
	SCT	25082004	RTR	Resting tremor
	SCT	26079004	TRM	Tremor
	SCT	49049000	SHK	Shaking
	SCT	17450006	JRK	Jerking movements
	SCT	718103001	TRB	Trembling
	SCT	399317006	BRK	Bradykinesia
	SCT	230332007	SLW	Slowness
	NPDR001	SLM	SLM	Slow movements
	SCT	55630000	COG	Cogwheel rigidity
	SCT	16046003	RIG	Rigidity
	NPDR001	STF	STF	Stiffness
	NPDR001	TIG	TIG	Tightness
	NPDR001	PST	PST	Postural instability
	SCT	193462001	FLL	Falling
	SCT	29831004	LOB	Loss of balance
	NPDR001	BAL	BAL	Difficulty in maintaining balance
	SCT	394616008	UGT	Unstable gait
	NPDR001	STM	STM	Stumbling
	NPDR001	USD	USD	Unsteadiness
	NPDR001	AAO	AAO	Asymmetry, at onset

	HL7 2.5.1 Coding System	HL7 2.5.1 Value	NPDR Code	Description
	NPDR001	MOV	MOV	More difficulty moving one side of the body than the other
	NPDR001	AEV	AEV	Asymmetry, ever (only if Asymmetry at onset is not available)
	NPDR001	DYS	DYS	Dysfunction (tremor, bradykinesia or rigidity) more pronounced on one side of body than the other
	NPDR001	HAL	HAL	Hallucinations/Delusions
User	NPDRTBI Code	**NPDR TBI Cause**	NPDRTBI Value	
	NPDRTBI		MOT	Motor vehicle accident
	NPDRTBI		FLL	Fall
	NPDRTBI		MET	Metabolic disorder
	NPDRTBI		DIS	Disease-related
User	NPDRSPORT Code	**NPDR Sport Code**	NPDRSPORT Value	
	NPDRSPORT		FTB	Football
	NPDRSPORT		BSK	Basketball
	NPDRSPORT		BAS	Baseball/Softball
	NPDRSPORT		SOC	Soccer
	NPDRSPORT		HKY	Hockey
	NPDRSPORT		RGB	Rugby
	NPDRSPORT		LCR	Lacrosse
	NPDRSPORT		BOX	Boxing/Martial Arts
	NPDRSPORT		SWM	Swimming
	NPDRSPORT		TAF	Running/Track & field
	NPDRSPORT		HRS	Horse riding/polo
	NPDRSPORT		CYC	Cycling
	NPDRSPORT		OTH	Other sport
	NPDRSPORT		No	No sport related
User	NPDFAM Code	**NPDR Family Member Relation Code**	NPDRFAM Value	
	NPDRFAM		FTH	Father
	NPDRFAM		MTH	Mother
	NPDRFAM		SIS	Sister
	NPDRFAM		BRO	Brother
	NPDRFAM		PGF	Paternal Grandfather
	NPDRFAM		PGM	Paternal Grandmother
	NPDRFAM		MGF	Maternal Grandfather
	NPDRFAM		MGM	Maternal Grandmother
	NPDRFAM		PGGF	Paternal Great Grandfather
	NPDRFAM		PGGM	Paternal Great Grandmother
	NPDRFAM		MGGF	Maternal Great Grandfather
	NPDRFAM		MGGM	Maternal Great Grandmother
	NPDRFAM		PU	Paternal Uncle
	NPDRFAM		PA	Paternal Aunt
	NPDRFAM		MU	Maternal Uncle
	NPDRFAM		MA	Maternal Aunt
	NPDRFAM		MC	Maternal Cousin
	NPDRFAM		PC	Paternal Cousin
User	NPDR002 Code	**NPDR Additional Questions Code**	NPDR002 Value	
	NPDR002		Q01	Have you ever exposed to pesticides?
	NPDR002		Q02	Well water?
	NPDR002		Q03	If you did drink well water, was it always filtered?
	NPDR002		Q04	Coffee (1 cup or more per week)?
	NPDR002		Q05	If yes, how many cups per day?
	NPDR002		Q06	Cigarettes?
	NPDR002		Q07	If yes, how many packs per year?
	NPDR002		Q08	Milk (1 day or more per week)?

HL7 2.5.1 Coding System	HL7 2.5.1 Value	NPDR Code	Description
NPDR002		Q09	NSAIDs (taken 1 day or more per week)?
NPDR002		Q10	Antioxidants (taken 1 day or more per week)?
NPDR002		Q11	Have you exercised more than one day per week over the past 10 years?
NPDR002		Q12	Have you acted out physically while sleeping in the last 10 years (yelling, punching, falling out of bed, etc.)?
NPDR002		Q13	Have you had a colonoscopy in the last 30 years?
NPDR002		Q14	Have you ever exhibited impulsive behaviors, such as excessive shopping or gambling, Internet or sex addiction, etc.)
NPDR002		Q15	Occupation
NPDR002		Q16	Current Clinician
NPDR002		Q17	Current Clinician Starting Date
NPDR002		Q18	Have you ever had a traumatic brain injury (TBI)?
NPDR002		Q19	Have you ever sustained a concussion?
NPDR002		Q20	Do you have any family members who had/have PD?
NPDR002		Q21	TBI Cause
NPDR002		Q22	Concussion Sport Related
NPDR002		Q23	Family member relationship
HL7	UCUM Code	**NPDR Frequency Code**	NPDR Frequency Value	
	UCUM	/h	HR	HR for Hour
	UCUM	/d	DY	DY for Day
	UCUM	/wk	WK	WK for Week
	UCUM	/mo	MO	MO for Month
	UCUM	/a	YR	YR for Year
HL7	CPT Code	**NPDR Procedure Code**	NPDR Procedure Value	
	CPT	61850		Twist drill or burr hole(s) for implantation of neurostimulator electrodes, cortical
	CPT	61860		Craniectomy or craniotomy for implantation of neurostimulator electrodes, cerebral, cortical
	CPT	61863		Twist drill, burr hole, craniotomy, or craniectomy with stereotactic implantation of neurostimulator electrode array in subcortical site (e.g., thalamus, globus pallidus, subthalamic nucleus, periventricular, periaqueductal gray) without use of intraoperative microelectrode recording; first array
	CPT	61864		Each additional array (List separately in addition to primary procedure) N/A
	CPT	61867		Twist drill, burr hole, craniotomy, or craniectomy with stereotactic implantation of neurostimulator electrode array in subcortical site (eg, thalamus, globus pallidus, subthalamic nucleus, periventricular, periaqueductal gray), with use of intraoperative microelectrode recording; first array
	CPT	61868		Each additional array (List separately in addition to primary procedure) N/A
	CPT	61870		Craniectomy for implantation of neurostimulator electrodes, cerebellar, cortical
	CPT	61880		Revision or removal of intracranial neurostimulator electrodes
	CPT	61885		Insertion or replacement of cranial neurostimulator pulse generator or receiver, direct or inductive coupling; with connection to a single electrode array
	CPT	61886		Insertion or replacement of cranial neurostimulator pulse generator or receiver, direct or inductive coupling; with connection to 2 or more electrode arrays
	CPT	61888		Revision or removal of cranial neurostimulator pulse generator or receiver
HL7	0396	**NPDR Specialty Code**	NPDR003 Value	
	SCT	394814009	01	General Practice
	SCT	394609007	02	General Surgery
	SCT	721943002	03	Allergy/Immunology
	SCT	418960008	04	Otolaryngology
	SCT	394577000	05	Anesthesiology
	SCT	394579002	06	Cardiology
	SCT	394582007	07	Dermatology
	SCT	419772000	08	Family Practice
	NPDR003	09	09	Interventional Pain Management
	SCT	394584008	10	Gastroenterology

HL7 2.5.1 Coding System	HL7 2.5.1 Value	NPDR Code	Description
SCT	419192003	11	Internal Medicine
SCT	416304004	12	Osteopathic Manipulative Medicine
SCT	394591006	13	Neurology
NPDR003	14	14	Neurosurgery
SCT	394585009	16	Obstetrics/Gynecology
NPDR003	17	17	Hospice and Palliative Care
SCT	394594003	18	Ophthalmology
SCT	394605001	19	Oral Surgery (Dentists only) (LLP)
SCT	422191005	20	Orthopedic Surgery
SCT	252425004	21	Cardiac Electrophysiology
SCT	394595002	22	Pathology
SCT	702923000	23	Sports Medicine
NPDR003	24	24	Plastic and Reconstructive Surgery
SCT	722424008	25	Physical Medicine and Rehabilitation
SCT	394587001	26	Psychiatry
SCT	394818007	27	Geriatric Psychiatry
SCT	408464004	28	Colorectal Surgery
SCT	19829001	29	Pulmonary Disease
SCT	169074008	30	Diagnostic Radiology
SCT	408456005	33	Thoracic Surgery
SCT	394612005	34	Urology
SCT	182548004	35	Chiropractic (LLP)
SCT	394649004	36	Nuclear Medicine
NPDR003	37	37	Pediatric Medicine
SCT	394811001	38	Geriatric Medicine
SCT	394589003	39	Nephrology
SCT	310157000	40	Hand Surgery
SCT	310105000	41	Optometry (LLP)
SCT	394807007	44	Infectious Disease
SCT	394583002	46	Endocrinology
SCT	722166003	48	Podiatry (LLP)
SCT	394810000	66	Rheumatology
NPDR003	70	70	Single or Multispecialty Clinic or Group Practice
SCT	394882004	72	Pain Management
SCT	400047006	76	Peripheral Vascular Disease
SCT	408463005	77	Vascular Surgery
SCT	408466002	78	Cardiac Surgery
SCT	446701002	79	Addiction Medicine
SCT	133903000	81	Critical Care (Intensivist)
SCT	408472002	82	Hematology
NPDR003	83	83	Hematology/Oncology
SCT	409968004	84	Preventive Medicine
SCT	408457001	85	Maxillofacial Surgery (LLP)
SCT	21450003	86	Neuropsychiatry
SCT	394593009	90	Medical Oncology
SCT	419321007	91	Surgical Oncology
SCT	419815003	92	Radiation Oncology
SCT	773568002	93	Emergency Medicine
SCT	736396009	94	Interventional Radiology
SCT	408446006	98	Gynecological/Oncology
NPDR003	99	99	Unknown Physician Specialty
SCT	720503005	C0	Sleep Medicine
SCT	736396009	C3	Interventional Cardiology
SCT	106289002	C5	Dentist
SCT	768837005	C6	Hospitalist
NPDR003	C7	C7	Advanced Heart Failure and Transplant Cardiology
SCT	8251000175101	C8	Medical Toxicology
NPDR003	C9	C9	Hematopoietic Cell Transplantation and Cellular Therapy
NPDR003	D3	D3	Medical Genetics and Genomics
SCT	770677000	D4	Undersea and Hyperbaric Medicine