Vermont Oxford Network – eNICQ 6 Documentation

eNICQ 6 External Data Interface Developer's Guide 2019

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Contents

Introduction

Purpose and Applicability

These instructions are intended to assist Vermont Oxford Network member IT departments, software vendors, and other third party developers in designing a data interface or import file structure that is compatible with the eNICQ 6 Infant Data Entry System. This document provides background information, design criteria, business process descriptions and detailed table formats that will be essential to implementing a successful data interface.

This document assumes that the reader has a technical background suited to the data interface discussion. These instructions apply to eNICQ 6; they do not apply to prior versions of eNICQ.

Background

Vermont Oxford Network provides a software product called eNICQ to assist members with infant data entry, correction and submission. The eNICQ software allows electronic data entry and secure submission of data via the internet to Vermont Oxford Network. To avoid duplication of data entry, many Vermont Oxford Network members and software vendors have developed methods of extracting data from their existing medical record systems and updating the eNICQ database with that information. Once extracted from the external software, the data can be completed, corrected and submitted to Vermont Oxford Network by eNICQ.

Data Accuracy Considerations

Before making a decision to pursue the design of an interface between eNICQ 6 and your external software, it is important to consider how closely data items within your external software match Vermont Oxford Network's data definitions. Each data item collected by Vermont Oxford Network has a precise definition, which is provided within Vermont Oxford Network's Database Manual of Operations, Part 2 (available for download at www.vtoxford.org/downloads).

As you determine whether to extract an entry from your hospital's software for use in the eNICQ 6 database, please confirm that the external software's definition of each item matches Vermont Oxford Network's definition. Comparison of the item's definition within the external software and Vermont Oxford Network's data definition should involve personnel associated with the clinical or data entry aspects of data collection during the design of the interface. Contact Vermont Oxford Network with any questions about data definitions. Quality assurance review should also be performed once the interface is implemented to ensure that the interface is writing accurate data to the eNICQ 6 database.

Maintenance Considerations

An additional consideration will be the commitment to ongoing support of the interface. The data items collected and the item definitions are subject to change each calendar year. Choosing to create an external data interface entails committing to ongoing support and annual maintenance of the interface for the duration of its use. Implementation of annual updates to the data interface is required by January 1st of each year. Details about the data items that will be collected and the definitions that will be used for the upcoming year are usually available from Vermont Oxford Network by late summer of the preceding year.

Vermont Oxford Network distributes manuals and instructions for submitting electronic data annually. These documents describe item definitions, eligibility requirements and data collection policies and procedures related to data submission. Each data item in the external tables has its own data definition, a precise explanation of the information required for the item. To ensure data integrity, care is required to determine that data transferred from external systems to eNICQ 6 are consistent with Vermont Oxford Network definitions and eligibility requirements. Item definitions are updated annually based on changing needs of the neonatal community and apply to infants born in a particular birth year. Each year, changes must be examined by your center's team to ensure that data transferred from external systems to the eNICQ 6 database are appropriate for each infant's birth year.

Infant eligibility criteria for Vermont Oxford Network databases have been established so that data from each member center is comparable to other member centers. Procedures should be established to ensure that data are collected for each eligible infant and that data are not collected for infants who are ineligible.

Refer to the following documents available at www.vtoxford.org/downloads and at www.vtoxford.org/SubmitData for variable names, descriptions, data item definitions and eligibility requirements:

- Vermont Oxford Network's Database Manual of Operations applies to Very Low Birth Weight (VLBW) data submission and Expanded data submission. Part 1 includes information about the data collection process, and Part 2 includes information about determining eligibility and data item definitions for the data items.

- Generally by late summer of each year, Vermont Oxford Network publishes Electronic Data Submission (EDS) Instructions, which include descriptions of new items and other changes for the upcoming birth year. A table is provided with variable names, descriptions, ranges and codes.

If you have any questions about either determining eligibility or interpreting data definitions, please contact support@vtoxford.org.

Vermont Oxford Network Databases and Eligibility Determination

The system that you design and implement must support eligibility determination in some way. This can be an automatic determination through SQL query, or it can be supported by giving your users the information necessary to determine eligibility by manual review of records.

During the enrollment process with Vermont Oxford Network, member centers select a data submission option. Members may submit data for Very Low Birth Weight (VLBW) infants only (VLBW data submission) or for all NICU infants (Expanded data submission). Detailed information on determining eligibility is available in Vermont Oxford Network's Database Manual of Operations, Part 2 at www.vtoxford.org/downloads.

- Members participating in VLBW data submission collect data items for each infant whose birth weight is between 401 and 1500 grams OR whose gestational age is between 22 weeks, 0 days and 29 weeks, 6 days (inclusive), regardless of where in the hospital the infant receives care. See Vermont Oxford Network's Database Manual of Operations for additional detail on VLBW data items.

- Members participating in Expanded data submission collect all VLBW items, as well as additional supplemental data items. Expanded data submission includes data for all infants eligible for VLBW data submission, and also includes data for infants with birth weights greater than 1500 grams who are admitted to the hospital's NICU or die within the first 28 days of life, regardless of gestational age. Infants born before 2018 must additionally have been admitted to your NICU without first having gone home. See Vermont Oxford Network's Database Manual of Operations for additional detail on supplemental data items.

Protected Health Information and HIPAA

Confidential patient data items are stored in your local eNICQ 6 database. Patient identifiers are protected health information as specified in the US Health Insurance Portability and Accountability Act of 1996 (HIPAA) and the regulations implementing HIPAA. eNICQ 6 has been designed to ensure that patient identifiers cannot be sent to Vermont Oxford Network ("VON") unless the submitting member has the appropriate agreement(s) in place with VON. Hospitals in the US must implement measures to protect protected health information from unauthorized access, as specified in the HIPAA Privacy and Security regulations. Users of eNICQ software should be sure to comply with local hospital policies and good information security practices to protect data in the eNICQ database. Hospitals outside of the US should work with their legal and information security departments to determine the appropriate safeguards required in their jurisdiction(s).

To avoid access to the eNICQ 6 tables by unauthorized personnel, system administrators should review the security options available in the eNICQ 6 System Administrator's Guide,

available at www.vtoxford.org/enicq, and ensure that the application is implemented to be accessible only to hospital staff members who have permission to access the data.

If you are unsure about the sufficiency of your information security safeguards, or have any difficulty implementing the instructions in the guide, please consult your IT department or a qualified information security professional for assistance, in order to avoid and prevent HIPAA violations and potential breaches of information security.

Establishing Database Connectivity

Your application may need to connect to the eNICQ 6 database for two reasons:

1) To read ID numbers from the database for ID assignment
2) To write extracted data to the external data table

Either of these functions can be accomplished manually instead (with user training) and both functions will be discussed in greater detail later in this document.

External applications access the eNICQ 6 database via SQL Server® Authentication or Windows Authentication. Instructions for connecting to the eNICQ 6 database are provided with the eNICQ 6 Installation Guide.

Identifying Your Application

Fields have been provided in the import data structure to allow you to identify your application and its version number. Please populate these fields so that Vermont Oxford Network is better able to support your product.

Vendors: Please use your product name and version number.

Centers: If your product is used by more than one VON center, please identify it with a new, unique name. If your product is an in-house application used only by your center, please identify it with the name "In-House Application". Version number is optional for In-House applications and can be left blank.

See Part 3 and Appendix A for details on the data structure.

Getting Help

The eNICQ Technical Support Team can answer questions you may have about the specifications described in this document. Please call 802-865-4814, extension 240, or email your questions to support@vtoxford.org.

Part 1: Data Flow and Data Preparation

Two Possible Methods for Data Interface

There are two different ways to design and implement your data interface with eNICQ:

1) Text file import from within the eNICQ application.
2) Direct write to tblExternalData on the eNICQ database on SQL Server®.

Either solution is an acceptable way to design and implement your data interface.

Text File Import: Data files in CSV (Comma Separated Value), JSON or XML (Extensible Markup Language) format may be imported to the external tables through the eNICQ 6 user interface. All data items can be included in a single file.

Vermont Oxford Network recommends using XML or JSON format for your data file as these formats are more robust and will likely present fewer troubleshooting challenges for your end users in the future.

If you have previously designed a data interface for eNICQ 5 using CSV format, the new eNICQ 6 application will be able to consume your legacy data files, although you will still need to add any new data items for the new year.

Please see the appendices at the end of this document for file format standards.

What's it like for your eNICQ users? Your eNICQ users will be responsible for generating the text file in your source application. Often, this is an output created through custom reporting options in your vendor-provided Medical Record System, or it is an output that your developers have specifically crafted for your in-house Medical Record System. Your users will need to understand how to generate the file and how to locate it in a simple browse dialog. File import is handled immediately after file selection with feedback to the user if the file has formatting or data problems. Data imported by text file will bypass tblExternalData.

Direct Write to Database: Vermont Oxford Network supports external systems designed to create or update records using the external data table, tblExternalData. External systems should NOT directly update the live data table, tblInfantData, as that would bypass data workflow and validation within the application.

In this model, only the XML or JSON formats are advised. You will write your entire import record set to the 'Data' field in tblExternalData in one of these formats. The 'ImportConnectionID' field should be filled with a '3' for XML content, a '2' for JSON content and a '1' if the content is CSV formatted (possible, but not recommended). The remaining fields will autofill.
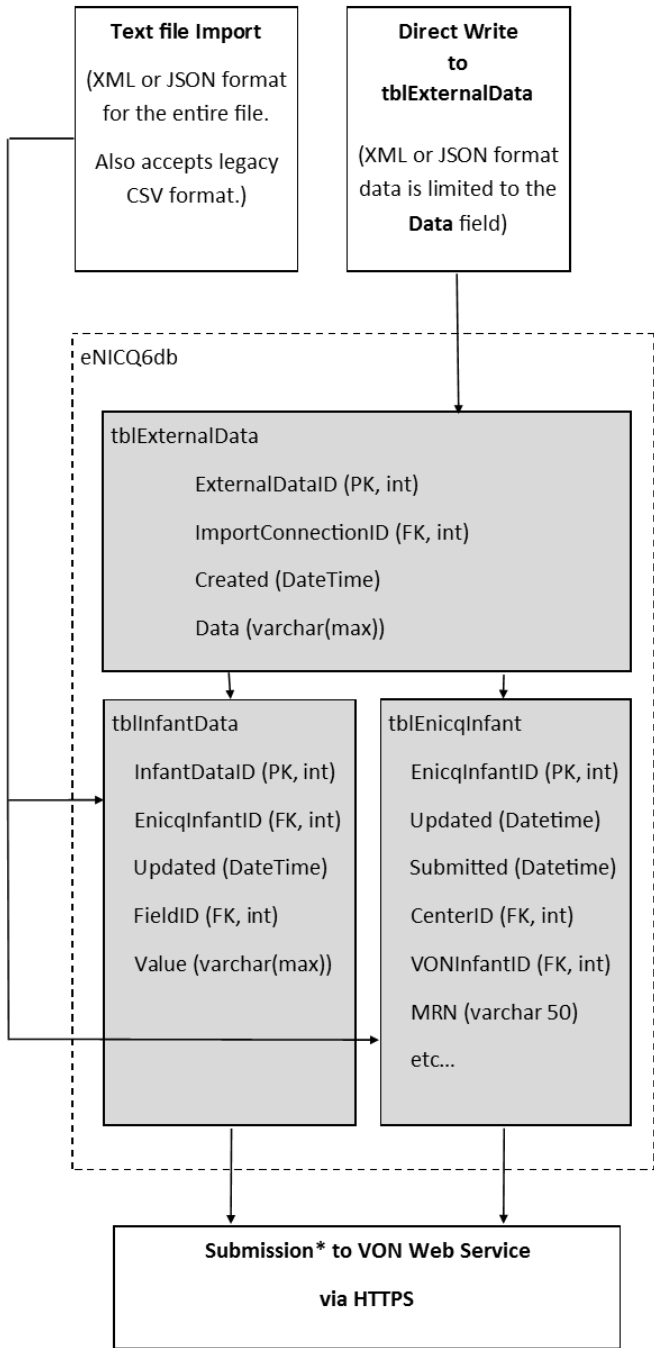
What's it like for your eNICQ users? Your eNICQ users will be responsible for initiating the data extraction in your source application. The next time they open the eNICQ application, the the remainder of the import routine within eNICQ will automatically launch. The import routine will add the new data to tblInfantData and clear the data from tblExternalData.

eNICQ 6 External Data Flow

Text file Import	Direct Write to tblExternalData
(XML or JSON format for the entire file. Also accepts legacy CSV format.)	(XML or JSON format data is limited to the Data field)

eNICQ6db

tblExternalData

ExternalDataID (PK, int)

ImportConnectionID (FK, int)

Created (DateTime)

Data (varchar(max))

tblInfantData

InfantDataID (PK, int)

EnicqInfantID (FK, int)

Updated (DateTime)

FieldID (FK, int)

Value (varchar(max))

tblEnicqInfant

EnicqInfantID (PK, int)

Updated (Datetime)

Submitted (Datetime)

CenterID (FK, int)

VONInfantID (FK, int)

MRN (varchar 50)

etc...

Submission* to VON Web Service via HTTPS

* Submissions only contain patient identifiers if specified in an additional Business Associates Agreement

Data can be introduced to the interface either by browsing for a text file to import from the eNICQ 6 application, or by writing directly to **tblExternalData** from the source application (if it has been designed by the vendor or developer to do this.)

Either option can be performed by placing your data in XML or JSON format. (CSV is also an option but not recommended.) When creating a text file, the XML or JSON structure will be the entirety of the file's contents. When writing to the database directly, the XML or JSON structure will be written to field **Data** of **tblExternalData**.

The external data table in eNICQ 6 is limited to a few housekeeping fields, plus the **Data** field. Each entry in the table represents a different import session with one or more records. The **Data** field is to be populated with the JSON or XML text representing one or more infant records. The **ImportConnectionID** field is to be populated with an integer representing the data format type:

> 1 = CSV Format
>
> 2 = JSON Format
>
> 3 = XML Format

The remaining fields, **ExternalDataID** and **Created** will be autofilled.

The infant data table (**tblInfantData**) in eNICQ 6 is organized differently than it was in the eNICQ 5 product and is not intended for direct read or write from vendor systems. This table is set up in key value pairs, enabling Vermont Oxford Network to easily alter data structure for future updates. An additional table, **tblEnicqInfant**, contains patient identifiers.

Data is written to **tblInfantData** when the user launches the import routine from within the eNICQ 6 application (either through file import or directly under the External Data Interface menu item.) Data is validated on import to **tblInfantData** and is also at that time submitted to Vermont Oxford Network's web servers (regardless of validation results.)

Differences and Similarities

As shown above, a text file import will bypass tblExternalData. This import method holds the dataset in memory for format review rather than in the tables. Both methods rely on an XML or

JSON data structure though: one in the form of a text file, the other in the form of a single entry to the 'Data' field.

Generating and Managing VON ID Numbers

Minimum Field Requirements. Regardless of which import method you choose to implement, your imported data set will need to contain a minimum set of values to be eligible for import. Each record in your data set MUST contain values for the following items:

- HOSPNO
- ID *or* MEDICALRECORDNUMBER
- DOB
- DELDIE
- LOCATE

Records that lack an entry to any of the above items will be rejected. This is a record-level rejection. It is possible that some records in a dataset will be rejected while others imported.

Key Field Value Assignment. Your model MUST use either ID or Medical Record Number consistently as the key field, always providing unique values for the field you have chosen.

Option #1 (recommended) If you choose to use Medical Record Number as your key field, then VON ID's can be left empty to be populated automatically by eNICQ.

Option #2 (supported) If you choose to use VON ID as your key field, your system will have to be responsible for reading, tracking and assigning VON ID accurately. This will involve either a design requirement for your software or a training requirement for your end users, or some combination of the two. The next section details options you might pursue in your design if you do not want eNICQ to automatically assign VON ID numbers.

Assigning VON ID Numbers from Your System. The VON ID value must be assigned prior to writing data to either the eNICQ database or an import file. Your system will need mechanisms to determine, assign and store VON ID numbers. There are several ways the value for ID numbers can be generated:

1. Direct read from the eNICQ 6 database.
2. User enters the first ID number, the system increments each following ID
3. User enters all ID numbers manually for every record.

Direct Read. Under this model, your system will determine what ID number to assign next on a record by pulling the maximum ID value from tblEnicqInfant in the eNICQ 6 database:

```
SELECT MAX(VonInfantID) from tblEnicqInfant WHERE CenterID =     [your center number]
```

Once you've established the current MaxID, increment it by one with each infant record you are assigning a VON ID to.

This system works very well, so long as the eNICQ database contains the most recent, known records. In the event of a total loss of the database, this model would require manual

intervention to ensure that ID sequencing is restarted correctly (because it won't know what number to begin with otherwise).

This model is not appropriate for new members or centers lacking eNICQ 6 data.

This system is tolerant of users entering new records either in your source application or in the eNICQ application. If you plan to allow new record creation in either your source application or eNICQ, your users will need to understand and account for the possibility of ID collisions

User Enters First ID. Under this model, it is assumed that all new records will originate from your source system. It isn't necessary to read or write to the eNICQ database under this model, but you will not be able to add a record manually in eNICQ. All ID assignment is handled in the source application.

The user is responsible for telling your source application the starting VON ID number. You will provide a place to input it. All subsequent ID's are assigned automatically in your application, incremented from this starting number.

User Enters All IDs. Under this model, the user manually assigns all VON ID's through direct input in your system. The user will be responsible for determining what the next available VON ID number is based on their records or information available in eNICQ 6.

This system allows the most flexibility but places the most burden on the user to ensure that ID collisions or record overwrites do not occur through accidental re-use of a VON ID number.

Combined Methods. You can, of course, combine any of the above methods in your solution.

Logging VON ID Numbers. Your system will need to have a means of storing VON ID numbers assigned locally within your source database for future updates. This can be accomplished by adding a field to an existing table, or by adding a new link table.

Example of a link table added to your database:

```
tblLNKMyLinkTable
    OurID (FK, int)
    VonInfantID (FK, int)
    Deleted (bit)
```

You will need to log the VON ID to your local table at the time of assignment. You will also want to track record deletion by VON ID in some way as well if your system does not currently have a simple way of determining if a record is deleted or scheduled for deletion from the eNICQ database.

Add, Edit, and Delete of Records

The system you design and implement must be capable of adding, editing and deleting records from the eNICQ database. If your system isn't able to perform all of these functions, there may be limits to Vermont Oxford Network's ability to support the ongoing operation of your

interface. It is not sufficient to design a system that can only post a record once as correction of records is inevitable at some point.

The minimum steps for add, edit and delete are summarized below.

Add a Record.
- Determine and assign your primary key
  - Use the Medical Record Number *or*
  - Assign the new ID number. (VON recommends that you query tblEnicqInfant to determine next available ID).
    - Log the new ID number in your local database.
- Include and populate all required fields (HOSPNO, ID, DOB, DELDIE, LOCATE).
- Include and populate any additional fields that you intend to be imported.

Edit a Record.
- Determine and assign your primary key
  - Use the Medical Record Number *or*
  - Retrieve and use the VON ID number if it is stored in your local database.
- Include and populate all required fields (HOSPNO, ID, DOB, DELDIE, LOCATE).
- Include and populate any additional fields that you intend to be imported.

Delete a Record.
- Record deletion is not supported via the eNICQ 6 External Data Interface. To delete an imported record in eNICQ 6, please delete the record manually in eNICQ 6 as well as in your source application (or refrain from exporting to eNICQ from your source application in the future.)

Note that beyond the required fields, all other fields in the import record are optional. You can populate as few or as many of the fields as you like.

Imported Data Overwrites Existing Data (even when blank)

While it may sound redundant, it is worth pointing out that imported data will overwrite whatever values previously existed in data fields for an updated record in the eNICQ database. This can be confusing for users sometimes when a value has been left blank in your source system. A blank value in an incoming imported record will overwrite a populated value in the eNICQ database. To the user, this appears as "eNICQ deleted my data" but in reality what has happened is that the user has overwritten populated data with blank data.

Choosing which fields to import or not import is a setting that the user can modify and is described below.

The eNICQ Administrator May Control Which Data Fields to Import

Depending on the import model you have designed, the eNICQ Administrator may have additional tools within eNICQ allowing them to map data items for import. These options are

ONLY available when writing directly to tblExternalData. These options are NOT available when importing data from a text file.

An eNICQ user with the "Administrator" role decides which fields in the eNICQ database will be available for insert or update via EDI. This is managed by the administrator in the eNICQ user interface under 'External Data Interface' on the Advanced menu (gear icon, upper right).

A list of all fields eligible for import is presented here, allowing the user to check and uncheck which fields to import. This configuration only needs to be set once, but can be modified at any time. Checking the configuration is an important part of any set-up or troubleshooting of the External Data Interface.

To put it simply, if a data field will always be populated manually in eNICQ by the user after import, that data item shouldn't be checked for import by the user.

Skilled administrators can sometimes resolve problems with an import by temporarily modifying the fields that they are importing, or by using the "override" feature during data entry. Typically, the same settings should be maintained between imports, however, to avoid confusion.

Part 2: Data Evaluation and Validation

Regardless of import method (direct write to database or text file import), data will be subject to **evaluation** prior to import and **validation** following import. You will need to prepare your data so that it passes **evaluation**. In most cases, your system will not be concerned with the results of **validation** as that can usually be addressed through the user's data entry activity.

Data Evaluation. This process consists of a file format check and several checks for the data integrity of its contents. Failures during evaluation may result in the entire file or data set being rejected, one or more individual records being rejected, or a simple warning message.

- **Format Check.** The file or data structure must be in valid CSV, XML or JSON format. The entire file or dataset is rejected on a format failure. Exception: In some circumstances, CSV files might have corrupted records rejected at the record level and still allow the rest of the file to pass.

- **Required Fields.** Any record not having all required fields populated is rejected.

- **No Duplicate Primary Keys.** All records must have unique Hospno/ID pairs. Records that do not have a new, unique key will be rejected.

- **Single HOSPNO Value.** All records must have the same Hospno value or the entire file or data set fails.

- **Datatype Check.** Any value that fails a datatype check for its field will result in a fail of the whole dataset.

- **Extraneous Fields.** Unrecognized or out of date fields are reported as a warning to the user but are not imported. They do not cause the record to be rejected.

Following an evaluation, the user will be given a chance to review any issues in a more detailed report displayed on-screen.

Data Validation. The validation process happens after the user has selected the option to import the new data. Validation consists of running the same business rules that are applied during manual data entry and updating warnings, error messages and status codes for the imported records.

Undoing an Import. There is no way to undo an import action. For this reason, we advise users to perform a data backup prior to using the interface if they are concerned about the possible results. While the evaluation process allows some early detection of problems, it isn't able to predict and report the final results in advance.

Reviewing Reports. The evaluation and import routines log to text files stored in the data directory C:\ProgramData\VON. Reviewing these reports may assist in troubleshooting problems while developing your data interface. These text files are named "eval_ImportDetails" or "ImportDetails", followed by a datestamp and the .log extension.

Part 3: Data and File Formats

Overall, Vermont Oxford Network recommends using XML as your data format for the External Data Interface, unless your business processes or staff skills suggest another option. The JSON format is a close second, having the same expected level of stability and functionality as XML. While CSV is still supported, it is a less stable format and not recommended.

Either data format can be used for the direct write or file import options.

Format May Vary with Content. Data items that are not populated in your data set will not be included in your file format. For example, if your data set doesn't have any entries for SRGCD10, you don't need to include the data item in your structure. This is true for all three formats (XML, JSON, CSV). Effort has been made to provide sample files that contain all data items in some capacity, but not all records will contain all possible data items.

Sample Files. Sample files are available in the Downloads section of the main page of this documentation in our Knowledge Base.

Sample files typically show the key fields Hospno and ID at the front of the record, with all remaining items listed alphabetically from there on. The actual sequence of the data items does not matter in any format, but front loading the key fields can aid in finding a record if you are reviewing the file in a text editor.

See **Appendix A** for data item details, particularly business logic and response ranges. While **Appendix A** details the CSV format, the logical descriptions apply to all formats.

See **Appendices C** and **D** for additional information on handling nulls and special characters in XML format.

Format Comparison

	Stable and Easy to Validate?	Usable for Direct Write to Database?	Backwards Compatible with eNICQ 5?	eNICQ 6 Can Export to this File Format?
XML	Yes	Yes	Yes	Yes
JSON	Yes	Yes	No	Yes
CSV	No	No	Yes	No

Appendix A: CSV File Structure (for 2019)

Scope and Usage: This appendix describes the CSV file format, but the Description/Range of Acceptable Values entries may be useful information to developers in any format. Up-to-date information on Data Ranges can also be found in the document Instructions for Electronic Data Submission available for download on Vermont Oxford Network's website.

Double Quotes within CSV Files: Entries for text data (anything listed in the appendices with a varchar or nvarchar data type) should be wrapped in double quotes when using the CSV file format for import to eNICQ. The double quotes characters should be used only to wrap text entries, with one double quote character at the beginning of the entry and a second one at the end of the entry. No embedded double quotes characters can appear in between the wrapping double quotes. This problem may occur in name fields where nicknames or temporary names have been marked with double quotes ("Baby Boy," for example) or in some of the larger notes fields such as BDEFECT or OSRGDESC where clinical notes may contain double quotes. Any embedded double quotes should be stripped from the text before attempting to import a CSV file into eNICQ.

Sequence of Data Items: The data items in this appendix are listed in no particular order. Your CSV, XML or JSON file similarly does not need to be created with the data items in any particular order. Placing key fields Hospno, MedicalRecordNumber and ID in the front of your sequence may help read the file visually if you ever need to.

	Name	Description/Range of Acceptable Values	SQL Server® Data Type	Max Length (Bytes)	Allow Nulls
🔑	HOSPNO	Center Number	smallint	4	✗
🔑	MEDICALRECORDNUMBER	Medical Record Number	varchar(50)	50	✗
	ID	Vermont Oxford Network Patient ID Number Range: 1 to 99,999,999	Int	4	✓
	PATIENTFIRSTNAME	Infant's first name	varchar(50)	50	✓
	PATIENTLASTNAME	Infant's last name	varchar(50)	50	✓
	MOTHERFIRSTNAME	Mother's first name	varchar(50)	50	✓
	MOTHERLASTNAME	Mother's last name	varchar(50)	50	✓
	DOB	Date of birth	datetime	8	✓
	DOA	Date infant was first admitted to the reporting hospital	datetime	8	✓

Name	Description/Range of Acceptable Values	SQL Server® Data Type	Max Length (Bytes)	Allow Nulls
DID	Date of initial disposition: date the infant was first discharged home, first transferred to another hospital or died, whichever comes first.	datetime	8	✓
DFD	Date of Final Disposition: date the infant was first discharged home or died, whichever comes first. If the infant was still hospitalized at one year of age, without having gone home, this is the date of first birthday.	datetime	8	✓
NOTES	Notes: for local use if user desires to annotate infant record.	varchar(2500)	2500	✓
SourceApplicationName	Source Application Name: name of the external application populating this table.	varchar(100)	100	✓
SourceApplicationVersion	Source Application Version: version of the external application populating this table.	varchar(25)	25	✓
BWGT	Birth Weight (grams) Range: <u>VLBW data submission</u>: 401 to 1500, 99999 (may be <401 or >1500 if [GAWEEKS] is between 22 and 29) <u>Expanded data submission</u>: Same as VLBW but also includes infants >1500 grams who are otherwise eligible. See eligibility criteria in Manual of Operations. Codes: 99999=Unknown	int	4	✓
GAWEEKS	Gestational Age, Weeks Range: 15 to 46, 99 Codes: 99=Unknown	smallint	2	✓
GADAYS	Gestational Age, Days Range: 0 to 6, 99 Codes: 99=Unknown	smallint	2	✓
DELDIE	Died in the Delivery Room or Resuscitation Area within 12 hours of birth and prior to NICU admission Range: 0, 1 Codes: 0=No, 1=Yes	tinyint	1	✓
LOCATE	Location of Birth Range: 0, 1 Codes: 0=Inborn, 1=Outborn	tinyint	1	✓

Name	Description/Range of Acceptable Values	SQL Server® Data Type	Max Length (Bytes)	Allow Nulls
SEX	Sex of Infant Range: 0, 1, 9 Codes: 0=Female, 1=Male, 9=Unknown	tinyint	1	✓
BHEADCIR	Head Circumference at Birth (cm, rounded to nearest 10th) Range: 10.0 to 70.0, 777.7, 999.9 Codes: 777.7=N/A, 999.9=Unknown	float	8	✓
HISP	Ethnicity of Mother Range: 0, 1, 9 Codes: 0=Not Hispanic, 1=Hispanic, 9=Unknown	tinyint	1	✓
PCARE	Prenatal Care Range: 0, 1, 9 Codes: 0=No, 1=Yes, 9=Unknown	tinyint	1	✓
ASTER	Antenatal Steroids Range: 0, 1, 9 Codes: 0=No, 1=Yes, 9=Unknown	tinyint	1	✓
VAGDEL	Mode of Delivery Range: 0, 1, 9 Codes: 0=Cesarean Section, 1=Vaginal, 9=Unknown	tinyint	1	✓
MULT	Multiple Gestation Range: 0, 1, 9 Codes: 0=No, 1=Yes, 9=Unknown	tinyint	1	✓
NBIRTHS	Number of Infants Delivered Range: 1 to 10, 77, 99 Codes: 77=N/A, 99=Unknown. Use 77 if [MULT]=0. Use 99 if [MULT]=9	smallint	2	✓
AP1	APGAR Score at 1 Minute Range: 0 to 10, 99 Codes: 99=Unknown	smallint	2	✓
AP5	APGAR Score at 5 Minutes Range: 0 to 10, 99 Codes: 99=Unknown	smallint	2	✓
ATEMPM	Temperature Measured within the First Hour after Admission to Your NICU Range: 0, 1, 7, 9 Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown. Use 7 if [DELDIE]=1	tinyint	1	✓
ATEMP	Temperature within the First Hour after Admission to Your NICU (degrees centigrade, rounded to nearest 10th) Range: 20.0 to 45.0, 777.7, 999.9 Codes: 777.7=N/A, 999.9=Unknown. Use 777.7 if [ATEMPTM]=0 or 7	float	8	✓
DROX	Oxygen during Initial Resuscitation Range: 0, 1, 9 Codes: 0=No, 1=Yes, 9=Unknown	tinyint	1	✓
DRBM	Face Mask Ventilation during Initial Resuscitation Range: 0, 1, 9 Codes: 0=No, 1=Yes, 9=Unknown	tinyint	1	✓
DRET	Endotracheal Tube Ventilation during Initial Resuscitation Range: 0, 1, 9 Codes: 0=No, 1=Yes, 9=Unknown	tinyint	1	✓
DREP	Epinephrine during Initial Resuscitation Range: 0, 1, 9 Codes: 0=No, 1=Yes, 9=Unknown	tinyint	1	✓
DRCC	Cardiac Compression during Initial Resuscitation Range: 0, 1, 9 Codes: 0=No, 1=Yes, 9=Unknown	tinyint	1	✓
NEWOX28	Oxygen on Day 28 Range: 0, 1, 7, 9 Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown. Use 7 if [DELDIE]=1 or infant not hospitalized on Day 28	tinyint	1	✓
USOUND1	Cranial Imaging on or before Day 28 Range: 0, 1, 7, 9 Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown. Use 7 if [DELDIE]=1	tinyint	1	✓
UGRADE1	Periventricular-Intraventricular Hemorrhage (PIH), Worst Grade Range: 0 to 4, 7, 9 Codes: 7=N/A, 9=Unknown. Use 7 if [USOUND1]=0 or 7. Use 9 if [USOUND1]=9	tinyint	1	✓

Name	Description/Range of Acceptable Values	SQL Server® Data Type	Max Length (Bytes)	Allow Nulls
DIE12	Died Within 12 Hours of Admission to Your NICU Range: 0, 1, 7, 9 Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown. Use 7 if [DELDIE]=1	tinyint	1	✓
OXY	Oxygen after Initial Resuscitation Range: 0, 1, 7, 9 Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown. Use 7 if [DELDIE]=1	tinyint	1	✓
CPAP	Nasal CPAP after Initial Resuscitation Range: 0, 1, 7, 9 Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown. Use 7 if [DELDIE]=1	tinyint	1	✓
CPAPES	Nasal CPAP before or without ever having received ETT Ventilation Range: 0, 1, 7, 9 Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown. Use 7 if ([BYEAR ≥2013 and [DRCPAP] in (0,7) and [CPAP] in (0,7) or if ([BYEAR] <2013 and [CPAP] in (0,7). Use 9 if {[BYEAR] ≥2013 and ([DRCPAP] in (0,9) and [CPAP]=9) or ([DRCPAP]=9 and [CPAP] in (0,9))} or ([BYEAR] <2013 and [CPAP]=9). Use 1 if [DRCPAP]=1 or [CPAP]=1 and no ETT Ventilation was used.	tinyint	1	✓
VENT	Conventional Ventilation after Initial Resuscitation Range: 0, 1, 7, 9 Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown. Use 7 if [DELDIE]=1	tinyint	1	✓
HFV	High Frequency Ventilation after Initial Resuscitation Range: 0, 1, 7, 9 Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown. Use 7 if [DELDIE]=1	tinyint	1	✓
HFNC	High Flow Nasal Cannula after Initial Resuscitation Range: 0, 1, 7, 9 Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown. Use 7 if [DELDIE]=1	tinyint	1	✓
NIMV	Nasal IMV or SIMV after Initial Resuscitation Range: 0, 1, 7, 9 Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown. Use 7 if [DELDIE]=1	tinyint	1	✓
DRSURF	Surfactant during Initial Resuscitation Range: 0, 1, 9 Codes: 0=No, 1=Yes, 9=Unknown	tinyint	1	✓
SURFX	Surfactant at Any Time Range: 0, 1, 9 Codes: 0=No, 1=Yes, 9=Unknown. Use 1 if [DRSURF]=1	tinyint	1	✓
SURF1DHR	Age at First Dose of Surfactant (hours) Range: 0 to 6665, 7777, 9999 Codes: 7777=N/A, 9999=Unknown. Use 7777 if [SURFX]=0. Use 9999 if [SURFX]=9	smallint	2	✓
SURF1DMIN	Age at First Dose of Surfactant (minutes) Range: 0 to 59, 77, 99 Codes: 77=N/A, 99=Unknown. Use 77 if [SURFX]=0. Use 99 if [SURFX]=9	smallint	2	✓
RDS	Respiratory Distress Syndrome Range: 0, 1, 7, 9 Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown. Use 7 if [DELDIE]=1	tinyint	1	✓
PNTX	Pneumothorax Range: 0, 1, 7, 9 Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown. Use 7 if [DELDIE]=1	tinyint	1	✓
OX36	Oxygen at 36 Weeks Range: 0, 1, 7, 9 Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown. Use 7 if [DELDIE]=1. Use 7 if rounded [GAWEEKS] > 36. Use 7 if infant is not hospitalized at 36 weeks GA	tinyint	1	✓
STERBPD	Steroids for CLD Range: 0, 1, 7, 9 Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown. Use 7 if [DELDIE]=1	tinyint	1	✓

Name	Description/Range of Acceptable Values	SQL Server® Data Type	Max Length (Bytes)	Allow Nulls
PDA	Patent Ductus Arteriosus Range: 0, 1, 7, 9 Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown. Use 7 if [DELDIE]=1	tinyint	1	✓
INDOMETH	Indomethacin Range: 0, 1, 7, 9 Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown. Use 7 if [DELDIE]=1	tinyint	1	✓
NEC	Necrotizing Enterocolitis Range: 0, 1, 7, 9 Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown. Use 7 if [DELDIE]=1	tinyint	1	✓
GIPERF	Focal Intestinal Perforation Range: 0, 1, 7, 9 Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown. Use 7 if [DELDIE]=1	tinyint	1	✓
EBSEPS	Bacterial Sepsis on or before Day 3 Range: 0, 1, 7, 9 Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown. Use 7 if [DELDIE]=1	tinyint	1	✓
LBPATH	Bacterial Pathogen after Day 3 Range: 0, 1, 7, 9 Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown. Use 7 if [DELDIE]=1. Use 7 if infant not hospitalized after day 3	tinyint	1	✓
CNEGSTAPH	Coagulase Negative Staph Infection after Day 3 Range: 0, 1, 7, 9 Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown. Use 7 if [DELDIE]=1. Use 7 if infant not hospitalized after day 3	tinyint	1	✓
FUNGAL	Fungal Infection after Day 3 Range: 0, 1, 7, 9 Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown. Use 7 if [DELDIE]=1. Use 7 if infant not hospitalized after day 3	tinyint	1	✓
PVL	Cystic Periventricular Leukomalacia Range: 0, 1, 7, 9 Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown. Use 7 if [DELDIE]=1. Use 7 if no cranial ultrasound was done	tinyint	1	✓
EYEX	Retinal Examination Range: 0, 1, 7, 9 Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown. Use 7 if [DELDIE]=1	tinyint	1	✓
ISTAGE	ROP Stage Range: 0 to 5, 7, 9 Codes: 7=N/A, 9=Unknown. Use 7 if [EYEX]=0, 7. Use 9 if [EYEX]=9	tinyint	1	✓
CMAL	Major Birth Defect Range: 0, 1, 9 Codes: 0=No, 1=Yes, 9=Unknown	tinyint	1	✓
BDCD1	First Birth Defect Code Range: See Manual of Operations, Appendix C for applicable codes, 7777, 9999 Codes: 7777=N/A, 9999=Unknown. Use 7777 if [CMAL]=0	smallint	2	✓
BDCD2	Second Birth Defect Code Range: See Manual of Operations, Appendix C for applicable codes, 7777, 9999 Codes: 7777=N/A, 9999=Unknown. Use 7777 if [CMAL]=0	smallint	2	✓
BDCD3	Third Birth Defect Code Range: See Manual of Operations, Appendix C for applicable codes, 7777, 9999 Codes: 7777=N/A, 9999=Unknown. Use 7777 if [CMAL]=0	smallint	2	✓
BDCD4	Fourth Birth Defect Code Range: See Manual of Operations, Appendix C for applicable codes, 7777, 9999 Codes: 7777=N/A, 9999=Unknown. Use 7777 if [CMAL]=0	smallint	2	✓

Name	Description/Range of Acceptable Values	SQL Server® Data Type	Max Length (Bytes)	Allow Nulls
BDCD5	Fifth Birth Defect Code Range: See Manual of Operations, Appendix C for applicable codes, 7777, 9999 Codes: 7777=N/A, 9999=Unknown. Use 7777 if [CMAL]=0	smallint	2	✓
BDEFECT	Birth Defect Description Range: Free text, "77", "99" Codes: "77"=N/A, "99"=Unknown. Use "77" if [CMAL]=0. Use "77" if [CMAL]=1 and Birth Defect Codes entered do not require description (see Manual of Operations)	nvarchar(255)	510	✓
SRGLIG	PDA Ligation Range: 0, 1, 7, 9 Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown. Use 7 if [DELDIE]=1	tinyint	1	✓
NECSURG	NEC Surgery Range: 0, 1, 7, 9 Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown. Use 7 if [DELDIE]=1	tinyint	1	✓
ROPSURG	ROP Surgery Range: 0, 1, 7, 9 Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown. Use 7 if [DELDIE]=1	tinyint	1	✓
OSURG	Other Surgery Range: 0, 1, 7, 9 Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown. Use 7 if [DELDIE]=1	tinyint	1	✓
SRGCD1	First Surgery Code Range: See Manual of Operations, Appendix D for applicable codes, "77", "99" Codes: "77"=N/A, "99"=Unknown. Use "77" if ([OSURG]=0 or 7 and [NECSURG]=0 or 7). Use "99" if ([NECSURG]=9 and [OSURG]= 0 or 9) or ([NECSURG]=0 or 9 and [OSURG]=9)	nvarchar(6)	12	✓
SRGCD2	Second Surgery Code Range: See Manual of Operations, Appendix D for applicable codes, "77", "99" Codes: "77"=N/A, "99"=Unknown. Use "77" if ([OSURG]=0 or 7 and [NECSURG]=0 or 7). Use "99" if ([NECSURG]=9 and [OSURG]= 0 or 9) or ([NECSURG]=0 or 9 and [OSURG]=9)	nvarchar(6)	12	✓
SRGCD3	Third Surgery Code Range: See Manual of Operations, Appendix D for applicable codes, "77", "99" Codes: "77"=N/A, "99"=Unknown. Use "77" if ([OSURG]=0 or 7 and [NECSURG]=0 or 7). Use "99" if ([NECSURG]=9 and [OSURG]= 0 or 9) or ([NECSURG]=0 or 9 and [OSURG]=9)	nvarchar(6)	12	✓
SRGCD4	Fourth Surgery Code Range: See Manual of Operations, Appendix D for applicable codes, "77", "99" Codes: "77"=N/A, "99"=Unknown. Use "77" if ([OSURG]=0 or 7 and [NECSURG]=0 or 7). Use "99" if ([NECSURG]=9 and [OSURG]= 0 or 9) or ([NECSURG]=0 or 9 and [OSURG]=9)	nvarchar(6)	12	✓
SRGCD5	Fifth Surgery Code Range: See Manual of Operations, Appendix D for applicable codes, "77", "99" Codes: "77"=N/A, "99"=Unknown. Use "77" if ([OSURG]=0 or 7 and [NECSURG]=0 or 7). Use "99" if ([NECSURG]=9 and [OSURG]= 0 or 9) or ([NECSURG]=0 or 9 and [OSURG]=9)	nvarchar(6)	12	✓
SRGCD6	Sixth Surgery Code Range: See Manual of Operations, Appendix D for applicable codes, "77", "99" Codes: "77"=N/A, "99"=Unknown. Use "77" if ([OSURG]=0 or 7 and [NECSURG]=0 or 7). Use "99" if ([NECSURG]=9 and [OSURG]= 0 or 9) or ([NECSURG]=0 or 9 and [OSURG]=9)	nvarchar(6)	12	✓

Name	Description/Range of Acceptable Values	SQL Server® Data Type	Max Length (Bytes)	Allow Nulls
SRGCD7	Seventh Surgery Code Range: See Manual of Operations, Appendix D for applicable codes, "77", "99" Codes: "77"=N/A, "99"=Unknown. Use "77" if ([OSURG]=0 or 7 and [NECSURG]=0 or 7). Use "99" if ([NECSURG]=9 and [OSURG]=0 or 9) or ([NECSURG]=0 or 9 and [OSURG]=9)	nvarchar(6)	12	✓
SRGCD8	Eighth Surgery Code Range: See Manual of Operations, Appendix D for applicable codes, "77", "99" Codes: "77"=N/A, "99"=Unknown. Use "77" if ([OSURG]=0 or 7 and [NECSURG]=0 or 7). Use "99" if ([NECSURG]=9 and [OSURG]= 0 or 9) or ([NECSURG]=0 or 9 and [OSURG]=9)	nvarchar(6)	12	✓
SRGCD9	Ninth Surgery Code Range: See Manual of Operations, Appendix D for applicable codes, "77", "99" Codes: "77"=N/A, "99"=Unknown. Use "77" if ([OSURG]=0 or 7 and [NECSURG]=0 or 7). Use "99" if ([NECSURG]=9 and [OSURG]=0 or 9) or ([NECSURG]=0 or 9 and [OSURG]=9)	nvarchar(6)	12	✓
SRGCD10	Tenth Surgery Code Range: See Manual of Operations, Appendix D for applicable codes, "77", "99" Codes: "77"=N/A, "99"=Unknown. Use "77" if ([OSURG]=0 or 7 and [NECSURG]=0 or 7). Use "99" if ([NECSURG]=9 and [OSURG]=0 or 9) or ([NECSURG]=0 or 9 and [OSURG]=9)	nvarchar(6)	12	✓
OSRGDESC	Surgical Code Description Range: Free text, "77", "99" Codes: "77"=N/A, "99"=Unknown. Use "77" if [OSURG]=0. Use "77" if [OSURG]=1 and Surgery Codes entered do not require description (see Manual of Operations). Use "99" if ([NECSURG]=9 and [OSURG]=0 or 9) or ([NECSURG]=0 or 9 and [OSURG]=9)	varchar(255)	255	✓
FDISP	Initial Disposition Range: 1, 2, 3, 5, 7, 9 Codes: 1=Home, 2=Transferred, 3=Died, 5=Still Hospitalized as of First Birthday, 7=N/A, 9=Unknown. Use 7 if [DELDIE]=1	tinyint	1	✓
ENTFEED	Enteral Feeding at Discharge Range: 0, 1, 2, 3, 7, 9 Codes: 0=None, 1=Human Milk Only, 2=Formula Only, 3=Human Milk with Fortifier or Formula, 7=N/A, 9=Unknown. Use 7 if [DELDIE]=1	tinyint	1	✓
DWGT	Weight at Initial Disposition (grams) Range: 201 to 66665, 77777, 99999 Codes: 77777=N/A, 99999=Unknown. Use 77777 if [DELDIE]=1	int	4	✓
DHEADCIR	Head Circumference at Initial Disposition (cm, rounded to nearest 10th) Range: 10.0 to 70.0, 777.7, 999.9 Codes: 777.7=N/A, 999.9=Unknown. Use 777.7 if [DELDIE]=1	float	8	✓
OXFINAL	Oxygen at Discharge Range: 0, 1, 7, 9 Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown. Use 7 if [DELDIE]=1	tinyint	1	✓
ACFINAL	Monitor at Discharge Range: 0, 1, 7, 9 Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown. Use 7 if [DELDIE]=1	tinyint	1	✓
TRANSCODE	Reason for Transfer Range: 0, 1, 2, 3, 4, 5, 7, 9 Codes: 0=ECMO, 1=Growth/Discharge Planning, 2=Medical/Diagnostic Services, 3=Surgery, 4=Chronic Care, 5=Other, 7=N/A, 9=Unknown. Use 7 if [FDISP]=1, 3, 5, 7. Use 9 if [FDISP]=9	tinyint	1	✓

Name	Description/Range of Acceptable Values	SQL Server® Data Type	Max Length (Bytes)	Allow Nulls
F2DISP	Post Transfer Disposition Range: 1, 2, 3, 4, 5, 7, 9 Codes: 1=Home, 2=Transferred Again, 3=Died, 4=Readmitted, 5=Still Hospitalized as of First Birthday, 7=N/A, 9=Unknown. Use 7 if [FDISP]=1, 3, 5, 7. Use 9 if [FDISP]=9	tinyint	1	✓
F3DISP	Disposition after Readmission Range: 1, 2, 3, 5, 7, 9 Codes: 1=Home, 2=Transferred, 3=Died, 5=Still Hospitalized as of First Birthday, 7=N/A, 9=Unknown. Use 7 if [F2DISP]=1, 2, 3, 5, 7. Use 9 if [F2DISP]=9	tinyint	1	✓
F3WGT	Weight at Disposition after Readmission (grams) Range: 201 to 66665, 77777, 99999 Codes: 77777=N/A, 99999=Unknown. Use 77777 if [F3DISP]=7. Use 99999 if [F3DISP]=9	int	4	✓
UDISP	Ultimate Disposition Range: 1, 3, 5, 7, 9 Codes: 1=Home, 3=Died, 5=Still Hospitalized as of First Birthday, 7=N/A, 9=Unknown. Use 7 if [F2DISP]=1, 3, 5, 7. Use 7 if [F3DISP]=1, 3, 5, 7. Use 9 if [F2DISP]=9. Use 9 if [F3DISP]=9	tinyint	1	✓
CHORIO	Chorioamnionitis Range: 0, 1, 9 Codes: 0=No, 1=Yes, 9=Unknown	tinyint	1	✓
MHYPERTENS	Maternal Hypertension, Chronic or Pregnancy-Induced Range: 0, 1, 9 Codes: 0=No, 1=Yes, 9=Unknown	tinyint	1	✓
INO	Inhaled Nitric Oxide Range: 0, 1, 7, 9 Codes: 0=No, 1=Yes, 9=Unknown. Use 7 if [DELDIE]=1	tinyint	1	✓
IBUPROFEN	Ibuprofen for PDA Range: 0, 1, 7, 9 Codes: 0=No, 1=Yes, 9=Unknown. Use 7 if [DELDIE]=1	tinyint	1	✓
OUTB_CTR	Transfer Code of Center from which outborn Infant Transferred Range: See http://www.vtoxford.org/transfers for applicable codes, 77777777, 99999999 Codes: 77777777=N/A, 99999999=Unknown. Use 77777777 if [LOCATE]=0.	int	4	✓
PIHWFO	PIH, Where First Occurred Range: 1, 2, 7, 9 Codes: 1=Your Hospital, 2=Other Hospital, 7=N/A, 9=Unknown. Use 7 if [USOUND1]=0 or 7. Use 7 if [UGRADE1]=0. Use 9 if [UGRADE1]=9.	tinyint	1	✓
INOWG	Inhaled Nitric Oxide, Where Given Range: 1, 2, 3, 7, 9 Codes: 1=Your Hospital, 2=Other Hospital, 3=Both Your Hospital and Other Hospital, 7=N/A, 9=Unknown. Use 7 if [INO]=0 or 7. Use 9 if [INO]=9.	tinyint	1	✓
STERBPDWG	Steroids for CLD, Where Given Range: 1, 2, 3, 7, 9 Codes: 1=Your Hospital, 2=Other Hospital, 3=Both Your Hospital and Other Hospital, 7=N/A, 9=Unknown. Use 7 if [STERBPD]=0 or 7. Use 9 if [STERBPD]=9.	tinyint	1	✓
SRGLIGWD	PDA Ligation, Where Done Range: 7 if [SRGLIG] in (0, 7); 1, 2, 3, 9 if [SRGLIG]=1; 9 if [SRGLIG]=9; Codes: 1=Your Hospital, 2=Other Hospital, 3=Both Your Hospital and Other Hospital, 7=N/A, 9=Unknown	tinyint	1	✓
ROPSURGWD	ROP Surgery, Where Done Range: 1, 2, 3, 7, 9 Codes: 1=Your Hospital, 2=Other Hospital, 3=Both Your Hospital and Other Hospital, 7=N/A, 9=Unknown. Use 7 if [ROPSURG]=0 or 7. Use 9 if [ROPSURG]=9.	tinyint	1	✓

Name	Description/Range of Acceptable Values	SQL Server® Data Type	Max Length (Bytes)	Allow Nulls
SRGLOC1	Location of Surgery, First Surgery Code Range: 1, 2, 3, 7, 9 Codes: 1=Your Hospital, 2=Other Hospital, 3=Both Your Hospital and Other Hospital, 7=N/A, 9=Unknown. Use 7 if [OSURG]=0 or 7 and [NECSURG]=0 or 7. Use 9 if ([OSURG] is 0 or 9 and [NECSURG]=9) or ([OSURG]=9 and [NECSURG] is 0 or 9).	tinyint	1	✓
SRGLOC2	Location of Surgery, Second Surgery Code Range: 1, 2, 3, 7, 9 Codes: 1=Your Hospital, 2=Other Hospital, 3=Both Your Hospital and Other Hospital, 7=N/A, 9=Unknown. Use 7 if [SRGCD2]=7 Use 9 if ([OSURG] is 0 or 9 and [NECSURG]=9) or ([OSURG]=9 and [NECSURG] is 0 or 9).	tinyint	1	✓
SRGLOC3	Location of Surgery, Third Surgery Code Range: 1, 2, 3, 7, 9 Codes: 1=Your Hospital, 2=Other Hospital, 3=Both Your Hospital and Other Hospital, 7=N/A, 9=Unknown. Use 7 if [SRGCD3]=7 Use 9 if ([OSURG] is 0 or 9 and [NECSURG]=9) or ([OSURG]=9 and [NECSURG] is 0 or 9).	tinyint	1	✓
SRGLOC4	Location of Surgery, Fourth Surgery Code Range: 1, 2, 3, 7, 9 Codes: 1=Your Hospital, 2=Other Hospital, 3=Both Your Hospital and Other Hospital, 7=N/A, 9=Unknown. Use 7 if [SRGCD4]=7 Use 9 if ([OSURG] is 0 or 9 and [NECSURG]=9) or ([OSURG]=9 and [NECSURG] is 0 or 9).	tinyint	1	✓
SRGLOC5	Location of Surgery, Fifth Surgery Code Range: 1, 2, 3, 7, 9 Codes: 1=Your Hospital, 2=Other Hospital, 3=Both Your Hospital and Other Hospital, 7=N/A, 9=Unknown. Use 7 if [SRGCD5]=7 Use 9 if ([OSURG] is 0 or 9 and [NECSURG]=9) or ([OSURG]=9 and [NECSURG] is 0 or 9).	tinyint	1	✓
SRGLOC6	Location of Surgery, Sixth Surgery Code Range: 1, 2, 3, 7, 9 Codes: 1=Your Hospital, 2=Other Hospital, 3=Both Your Hospital and Other Hospital, 7=N/A, 9=Unknown. Use 7 if [SRGCD6]=7 Use 9 if ([OSURG] is 0 or 9 and [NECSURG]=9) or ([OSURG]=9 and [NECSURG] is 0 or 9).	tinyint	1	✓
SRGLOC7	Location of Surgery, Seventh Surgery Code Range: 1, 2, 3, 7, 9 Codes: 1=Your Hospital, 2=Other Hospital, 3=Both Your Hospital and Other Hospital, 7=N/A, 9=Unknown. Use 7 if [SRGCD7]=7 Use 9 if ([OSURG] is 0 or 9 and [NECSURG]=9) or ([OSURG]=9 and [NECSURG] is 0 or 9).	tinyint	1	✓
SRGLOC8	Location of Surgery, Eighth Surgery Code Range: 1, 2, 3, 7, 9 Codes: 1=Your Hospital, 2=Other Hospital, 3=Both Your Hospital and Other Hospital, 7=N/A, 9=Unknown. Use 7 if [SRGCD8]=7 Use 9 if ([OSURG] is 0 or 9 and [NECSURG]=9) or ([OSURG]=9 and [NECSURG] is 0 or 9).	tinyint	1	✓
SRGLOC9	Location of Surgery, Ninth Surgery Code Range: 1, 2, 3, 7, 9 Codes: 1=Your Hospital, 2=Other Hospital, 3=Both Your Hospital and Other Hospital, 7=N/A, 9=Unknown. Use 7 if [SRGCD9]=7 Use 9 if ([OSURG] is 0 or 9 and [NECSURG]=9) or ([OSURG]=9 and [NECSURG] is 0 or 9).	tinyint	1	✓
SRGLOC10	Location of Surgery, Tenth Surgery Code Range: 1, 2, 3, 7, 9 Codes: 1=Your Hospital, 2=Other Hospital, 3=Both Your Hospital and Other Hospital, 7=N/A, 9=Unknown. Use 7 if [SRGCD10]=7 Use 9 if ([OSURG] is 0 or 9 and [NECSURG]=9) or ([OSURG]=9 and [NECSURG] is 0 or 9).	tinyint	1	✓

Name	Description/Range of Acceptable Values	SQL Server® Data Type	Max Length (Bytes)	Allow Nulls
PNTXWO	Pneumothorax, Where Occurred Range: 1, 2, 3, 7, 9 Codes: 1=Your Hospital, 2=Other Hospital, 3=Both Your Hospital and Other Hospital, 7=N/A, 9=Unknown. Use 7 if [PNTX]=0 or 7. Use 9 if [PNTX]=9.	tinyint	1	✓
NECWO	NEC, Where Occurred Range: 1, 2, 3, 7, 9 Codes: 1=Your Hospital, 2=Other Hospital, 3=Both Your Hospital and Other Hospital, 7=N/A, 9=Unknown. Use 7 if [NEC]=0 or 7. Use 9 if [NEC]=9.	tinyint	1	✓
GIPERFWO	Focal Intestinal Perforation, Where Occurred Range: 1, 2, 3, 7, 9 Codes: 1=Your Hospital, 2=Other Hospital, 3=Both Your Hospital and Other Hospital, 7=N/A, 9=Unknown. Use 7 if [GIPERF]=0 or 7. Use 9 if [GIPERF]=9.	tinyint	1	✓
LBPATHWO	Late Bacterial Pathogen, Where Occurred Range: 1, 2, 3, 7, 9 Codes: 1=Your Hospital, 2=Other Hospital, 3=Both Your Hospital and Other Hospital, 7=N/A, 9=Unknown. Use 7 if [LBPATH]=0 or 7. Use 9 if [LBPATH]=9.	tinyint	1	✓
CNEGWO	Coagulase Negative Staph Infection, Where Occurred Range: 1, 2, 3, 7, 9 Codes: 1=Your Hospital, 2=Other Hospital, 3=Both Your Hospital and Other Hospital, 7=N/A, 9=Unknown. Use 7 if [CNEGSTAPH]=0 or 7. Use 9 if [CNEGSTAPH]=9.	tinyint	1	✓
FUNGALWO	Fungal Infection, Where Occurred Range: 1, 2, 3, 7, 9 Codes: 1=Your Hospital, 2=Other Hospital, 3=Both Your Hospital and Other Hospital, 7=N/A, 9=Unknown. Use 7 if [FUNGAL]=0 or 7. Use 9 if [FUNGAL]=9.	tinyint	1	✓
XFER_CTR	Transfer Code of Center to which Infant Transferred Range: See http://www.vtoxford.org/transfers for applicable codes, 77777777, 99999999 Codes: 77777777=N/A, 99999999=Unknown. Use 77777777 if [FDISP]=1, 3, 5, 7.	int	4	✓

Name	Description/Range of Acceptable Values	SQL Server® Data Type	Max Length (Bytes)	Allow Nulls
DRCPAP	Nasal CPAP during Initial Resuscitation Range: 0, 1, 7, 9 Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown.	tinyint	1	✓
VENT36	Conventional Ventilation at 36 Weeks Range: 0, 1, 7, 9 Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown. Use 7 if [DELDIE]=1. Use 7 if rounded [GAWEEKS] > 36. Use 7 if infant is not hospitalized at 36 weeks GA.	tinyint	1	✓
HFV36	High Frequency Ventilation at 36 Weeks Range: 0, 1, 7, 9 Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown. Use 7 if [DELDIE]=1. Use 7 if rounded [GAWEEKS] > 36. Use 7 if infant is not hospitalized at 36 weeks GA.	tinyint	1	✓
HFNC36	High Flow Nasal Cannula at 36 Weeks Range: 0, 1, 7, 9 Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown. Use 7 if [DELDIE]=1. Use 7 if rounded [GAWEEKS] > 36. Use 7 if infant is not hospitalized at 36 weeks GA.	tinyint	1	✓
NIMV36	Nasal IMV or Nasal SIMV at 36 Weeks Range: 0, 1, 7, 9 Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown. Use 7 if [DELDIE]=1. Use 7 if rounded [GAWEEKS] > 36. Use 7 if infant is not hospitalized at 36 weeks GA.	tinyint	1	✓
CPAP36	Nasal CPAP at 36 Weeks Range: 0, 1, 7, 9 Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown. Use 7 if [DELDIE]=1. Use 7 if rounded [GAWEEKS] > 36. Use 7 if infant is not hospitalized at 36 weeks GA.	tinyint	1	✓
MATRACE	Race of Mother Range: 1, 3, 4, 5, 6, 7, 99 Codes: 1=Black, 3=White, 4=Asian, 5=American Indian or Alaska Native, 6=Native Hawaiian or Pacific Islander, 7=Other Race, 99=Unknown	smallint	2	✓
AMAGSULF	Antenatal Magnesium Sulfate Range: 0, 1, 7, 9 Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown Use 7 if [DELDIE]=1.	tinyint	1	✓
PROBIOTICS	Probiotics Range: 0, 1, 7, 9 Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown Use 7 if [DELDIE]=1.	tinyint	1	✓
ROPANTIVEGF	Treatment of ROP with Anti-VEGF Drug Range: 0, 1, 7, 9 Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown Use 7 if [DELDIE]=1.	tinyint	1	✓
MDIABETES	Maternal Diabetes Range: 0, 1, 9 [BYEAR] > 2017; Codes: 0=No, 1=Yes, 9=Unknown	tinyint	1	✓
CONGENINF	Congenital Infection Range: 0, 1, 9 if [BYEAR] > 2017; Codes: 0=No, 1=Yes, 9=Unknown	tinyint	1	✓
CONGENINFCD1	Congenital Infection, organism 1 Range: 7777 if [BYEAR] > 2017 and [CONGENINF]=0; 9999 if [BYEAR] > 2017 and [CONGENINF]=9; Congenital Infection Code if [BYEAR] > 2017 and [CONGENINF]=1; Codes: 7777=N/A, 9999=Unknown, Congenital Infection in Appendix E of Manual of Operations	smallint	2	✓
CONGENINFCD2	Congenital Infection, organism 2 Range: 7777 if [BYEAR] > 2017 and ([CONGENINF]=0 or no more infections); 9999 if [BYEAR] > 2017 and [CONGENINF]=9; Congenital Infection Code if [BYEAR] > 2017 and [CONGENINF]=1; Codes: 7777=N/A, 9999=Unknown, Congenital Infection in Appendix E of Manual of Operations	smallint	2	✓

Name	Description/Range of Acceptable Values	SQL Server® Data Type	Max Length (Bytes)	Allow Nulls
CONGENINFCD3	Congenital Infection, organism 3 Range: 7777 if [BYEAR] > 2017 and ([CONGENINF]=0 or no more infections); 9999 if [BYEAR] > 2017 and [CONGENINF]=9; Congenital Infection Code if [BYEAR] > 2017 and [CONGENINF]=1; Codes: 7777=N/A, 9999=Unknown, Congenital Infection in Appendix E of Manual of Operations	smallint	2	✓
DRLMA	Laryngeal Mask Airway During Initial Resuscitation Range: 0, 1, 9 if [BYEAR] > 2017; Codes: 0=No, 1=Yes, 9=Unknown	tinyint	1	✓
DRNIMV	Nasal Ventilation During Initial Resuscitation Range: 0, 1, 9; Codes: 0=No, 1=Yes, 9=Unknown	tinyint	1	✓
EBSEPSCD1	Bacterial Sepsis and/or Meningitis on or before Day 3, pathogen 1 Range: 7777 if [EBSEPS]=7, 9999 if [EBSEPS]=9, Bacterial organism code if EBSEPS=1; Codes: 7777=N/A, 9999=Unknown, Bacterial Pathogen Codes in Appendix B of Manual of Operations	tinyint	1	✓
EBSEPSCD2	Bacterial Sepsis and/or Meningitis on or before Day 3, pathogen 2 Range: 7777 if [EBSEPS]=7, 9999 if [EBSEPS]=9, Bacterial organism code if EBSEPS=1; Codes: 7777=N/A, 9999=Unknown, Bacterial Pathogen Codes in Appendix B of Manual of Operations	tinyint	1	✓
EBSEPSCD3	Bacterial Sepsis and/or Meningitis on or before Day 3, pathogen 3 Range: 7777 if [EBSEPS]=7, 9999 if [EBSEPS]=9, Bacterial organism code if EBSEPS=1; Codes: 7777=N/A, 9999=Unknown, Bacterial Pathogen Codes in Appendix B of Manual of Operations	tinyint	1	✓
ACETAMIN	Acetaminophen (Paracetamol) for PDA Range: 7 if [BYEAR] > 2017 and [DELDIE]=1; 0, 1, 9 if [BYEAR] > 2017 and [DELDIE]=0; Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown	tinyint	1	✓
CAFFEINE	Caffeine for Any Reason Range: 7 if [BYEAR] > 2017 and [DELDIE]=1; 0, 1, 9 if [BYEAR] > 2017 and [DELDIE]=0; Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown	tinyint	1	✓
VITAMINA	Intramuscular Vitamin A for Any Reason Range: 7 if ([BYEAR] > 2017 and [DELDIE]=1); 0, 1, 9 if ([BYEAR] > 2017 and [DELDIE]=0); Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown	tinyint	1	✓
PDASURG	Surgery or Interventional Catheterization for Closure of PDA Range: 7 if [BYEAR] > 2017 and [DELDIE]=1; 0, 1, 9 if [BYEAR] > 2017 and [DELDIE]=0; Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown	tinyint	1	✓
SRGSSI1	Surgical Site Infection at Your Hospital for First Surgery Code Procedure Range: 7 if [BYEAR] > 2017 and {([NECSURG] in (0,7) and [OSURG] in (0,7) and [PDASURG] in (0,7)) or [SRGCD1]="77" or [SRGLOC5] in (2,3)}; 9 if [BYEAR] > 2017 and {([NECSURG]=9 and [OSURG] in (0,9) and [PDASURG] in (0,9)) or ([NECSURG]=0 and [OSURG]=9 and [PDASURG] in (0,9)) or ([NECSURG]=0 and [OSURG]=0 and [PDASURG]=9) or [SRGLOC1]=9}; 0,1, 9 if [BYEAR] > 2017 and ([NECSURG]=1 or [OSURG]=1 or [PDASURG]=1) and [SRGCD1] has valid surgery code and [SRGLOC1]=1; Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown	tinyint	1	✓

Name	Description/Range of Acceptable Values	SQL Server® Data Type	Max Length (Bytes)	Allow Nulls
SRGSSI2	Surgical Site Infection at Your Hospital for Second Surgery Code Procedure Range: 7 if [BYEAR] > 2017 and {([NECSURG] in (0,7) and [OSURG] in (0,7) and [PDASURG] in (0,7)) or [SRGCD2]="77" or [SRGLOC5] in (2,3)}; 9 if [BYEAR] > 2017 and {([NECSURG]=9 and [OSURG] in (0,9) and [PDASURG] in (0,9)) or ([NECSURG]=0 and [OSURG]=9 and [PDASURG] in (0,9)) or ([NECSURG]=0 and [OSURG]=0 and [PDASURG]=9) or [SRGLOC2]=9}; 0,1, 9 if [BYEAR] > 2017 and ([NECSURG]=1 or [OSURG]=1 or [PDASURG]=1) and [SRGCD2] has valid surgery code and [SRGLOC2]=1; Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown	tinyint	1	✓
SRGSSI3	Surgical Site Infection at Your Hospital for Third Surgery Code Procedure Range: 7 if [BYEAR] > 2017 and {([NECSURG] in (0,7) and [OSURG] in (0,7) and [PDASURG] in (0,7)) or [SRGCD3]="77" or [SRGLOC5] in (2,3)}; 9 if [BYEAR] > 2017 and {([NECSURG]=9 and [OSURG] in (0,9) and [PDASURG] in (0,9)) or ([NECSURG]=0 and [OSURG]=9 and [PDASURG] in (0,9)) or ([NECSURG]=0 and [OSURG]=0 and [PDASURG]=9) or [SRGLOC3]=9}; 0,1, 9 if [BYEAR] > 2017 and ([NECSURG]=1 or [OSURG]=1 or [PDASURG]=1) and [SRGCD3] has valid surgery code and [SRGLOC3]=1; Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown	tinyint	1	✓
SRGSSI4	Surgical Site Infection at Your Hospital for Fourth Surgery Code Procedure Range: 7 if [BYEAR] > 2017 and {([NECSURG] in (0,7) and [OSURG] in (0,7) and [PDASURG] in (0,7)) or [SRGCD4]="77" or [SRGLOC5] in (2,3)}; 9 if [BYEAR] > 2017 and {([NECSURG]=9 and [OSURG] in (0,9) and [PDASURG] in (0,9)) or ([NECSURG]=0 and [OSURG]=9 and [PDASURG] in (0,9)) or ([NECSURG]=0 and [OSURG]=0 and [PDASURG]=9) or [SRGLOC4]=9}; 0,1, 9 if [BYEAR] > 2017 and ([NECSURG]=1 or [OSURG]=1 or [PDASURG]=1) and [SRGCD4] has valid surgery code and [SRGLOC4]=1; Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown	tinyint	1	✓
SRGSSI5	Surgical Site Infection at Your Hospital for Fifth Surgery Code Procedure Range: 7 if [BYEAR] > 2017 and {([NECSURG] in (0,7) and [OSURG] in (0,7) and [PDASURG] in (0,7)) or [SRGCD5]="77" or [SRGLOC5] in (2,3)}; 9 if [BYEAR] > 2017 and {([NECSURG]=9 and [OSURG] in (0,9) and [PDASURG] in (0,9)) or ([NECSURG]=0 and [OSURG]=9 and [PDASURG] in (0,9)) or ([NECSURG]=0 and [OSURG]=0 and [PDASURG]=9) or [SRGLOC5]=9}; 0,1, 9 if [BYEAR] > 2017 and ([NECSURG]=1 or [OSURG]=1 or [PDASURG]=1) and [SRGCD5] has valid surgery code and [SRGLOC5]=1; Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown	tinyint	1	✓

Name	Description/Range of Acceptable Values	SQL Server® Data Type	Max Length (Bytes)	Allow Nulls
SRGSSI6	Surgical Site Infection at Your Hospital for Sixth Surgery Code Procedure	tinyint	1	✓
	Range: 7 if [BYEAR] > 2017 and {([NECSURG] in (0,7) and [OSURG] in (0,7) and [PDASURG] in (0,7)) or [SRGCD6]="77" or [SRGLOC5] in (2,3)}; 9 if [BYEAR] > 2017 and {([NECSURG]=9 and [OSURG] in (0,9) and [PDASURG] in (0,9)) or ([NECSURG]=0 and [OSURG]=9 and [PDASURG] in (0,9)) or ([NECSURG]=0 and [OSURG]=0 and [PDASURG]=9) or [SRGLOC6]=9}; 0,1, 9 if [BYEAR] > 2017 and ([NECSURG]=1 or [OSURG]=1 or [PDASURG]=1) and [SRGCD6] has valid surgery code and [SRGLOC6]=1; Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown			
SRGSSI7	Surgical Site Infection at Your Hospital for Seventh Surgery Code Procedure	tinyint	1	✓
	Range: 7 if [BYEAR] > 2017 and {([NECSURG] in (0,7) and [OSURG] in (0,7) and [PDASURG] in (0,7)) or [SRGCD5]="77" or [SRGLOC5] in (2,3)}; 9 if [BYEAR] > 2017 and {([NECSURG]=9 and [OSURG] in (0,9) and [PDASURG] in (0,9)) or ([NECSURG]=0 and [OSURG]=9 and [PDASURG] in (0,9)) or ([NECSURG]=0 and [OSURG]=0 and [PDASURG]=9) or [SRGLOC7]=9}; 0,1, 9 if [BYEAR] > 2017 and ([NECSURG]=1 or [OSURG]=1 or [PDASURG]=1) and [SRGCD7] has valid surgery code and [SRGLOC7]=1; Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown			
SRGSSI8	Surgical Site Infection at Your Hospital for Eighth Surgery Code Procedure	tinyint	1	✓
	Range: 7 if [BYEAR] > 2017 and {([NECSURG] in (0,7) and [OSURG] in (0,7) and [PDASURG] in (0,7)) or [SRGCD8]="77" or [SRGLOC5] in (2,3)}; 9 if [BYEAR] > 2017 and {([NECSURG]=9 and [OSURG] in (0,9) and [PDASURG] in (0,9)) or ([NECSURG]=0 and [OSURG]=9 and [PDASURG] in (0,9)) or ([NECSURG]=0 and [OSURG]=0 and [PDASURG]=9) or [SRGLOC8]=9}; 0,1, 9 if [BYEAR] > 2017 and ([NECSURG]=1 or [OSURG]=1 or [PDASURG]=1) and [SRGCD8] has valid surgery code and [SRGLOC8]=1; Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown			
SRGSSI9	Surgical Site Infection at Your Hospital for Ninth Surgery Code Procedure	tinyint	1	✓
	Range: 7 if [BYEAR] > 2017 and {([NECSURG] in (0,7) and [OSURG] in (0,7) and [PDASURG] in (0,7)) or [SRGCD9]="77" or [SRGLOC5] in (2,3)}; 9 if [BYEAR] > 2017 and {([NECSURG]=9 and [OSURG] in (0,9) and [PDASURG] in (0,9)) or ([NECSURG]=0 and [OSURG]=9 and [PDASURG] in (0,9)) or ([NECSURG]=0 and [OSURG]=0 and [PDASURG]=9) or [SRGLOC9]=9}; 0,1, 9 if [BYEAR] > 2017 and ([NECSURG]=1 or [OSURG]=1 or [PDASURG]=1) and [SRGCD9] has valid surgery code and [SRGLOC9]=1; Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown			

Name	Description/Range of Acceptable Values	SQL Server® Data Type	Max Length (Bytes)	Allow Nulls
SRGSSI10	Surgical Site Infection at Your Hospital for Tenth Surgery Code Procedure	tinyint	1	✓
	Range: 7 if [BYEAR] > 2017 and {([NECSURG] in (0,7) and [OSURG] in (0,7) and [PDASURG] in (0,7)) or [SRGCD10]="77" or [SRGLOC5] in (2,3)}; 9 if [BYEAR] > 2017 and {([NECSURG]=9 and [OSURG] in (0,9) and [PDASURG] in (0,9)) or ([NECSURG]=0 and [OSURG]=9 and [PDASURG] in (0,9)) or ([NECSURG]=0 and [OSURG]=0 and [PDASURG]=9) or [SRGLOC10]=9}; 0,1, 9 if [BYEAR] > 2017 and ([NECSURG]=1 or [OSURG]=1 or [PDASURG]=1) and [SRGCD10] has valid surgery code and [SRGLOC10]=1; Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown			
LBPATHCD1	Bacterial Sepsis and/or Meningitis After Day 3, pathogen 1	smallint	2	✓
	Range: 7777 if [BYEAR] > 2017 and [LBPATH]=7; 9999 if [BYEAR] > 2017 and [LBPATH]=9; Bacterial organism code if [BYEAR] > 2017 and [LBPATH]=1; Codes: 7777=N/A, 9999=Unknown, Bacterial Pathogen Codes in Appendix B of Manual of Operations			
LBPATHCD2	Bacterial Sepsis and/or Meningitis After Day 3, pathogen 2	smallint	2	✓
	Range: 7777 if [BYEAR] > 2017 and ([LBPATH]=7 or no more pathogens); 9999 if [BYEAR] > 2017 and [LBPATH]=9; Bacterial organism code if [BYEAR] > 2017 and [LBPATH]=1; Codes: 7777=N/A, 9999=Unknown, Bacterial Pathogen Codes in Appendix B of Manual of Operations			
LBPATHCD3	Bacterial Sepsis and/or Meningitis After Day 3, pathogen 3	smallint	2	✓
	Range: 7777 if [BYEAR] > 2017 and ([LBPATH]=7 or no more pathogens); 9999 if [BYEAR] > 2017 and [LBPATH]=9; Bacterial organism code if [BYEAR] > 2017 and [LBPATH]=1; Codes: 7777=N/A, 9999=Unknown, Bacterial Pathogen Codes in Appendix B of Manual of Operations			
VENTFINAL	Conventional Ventilation at Discharge	tinyint	1	✓
	Range: 7 if [BYEAR] > 2017 and [DELDIE]=1; 0, 1, 9 if [BYEAR] > 2017 and [DELDIE]=0; Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown			
HFVFINAL	High Frequency Ventilation at Discharge	tinyint	1	✓
	Range: 7 if [BYEAR] > 2017 and [DELDIE]=1; 0, 1, 9 if [BYEAR] > 2017 and [DELDIE]=0; Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown			
HFNCFINAL	High Flow Nasal Cannula at Discharge	tinyint	1	✓
	Range: 7 if [BYEAR] > 2017 and [DELDIE]=1; 0, 1, 9 if [BYEAR] > 2017 and [DELDIE]=0; Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown			
NIMVFINAL	Nasal Ventilation at Discharge	tinyint	1	✓
	Range: 7 if [BYEAR] > 2017 and [DELDIE]=1; 0, 1, 9 if [BYEAR] > 2017 and [DELDIE]=0; Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown			
CPAPFINAL	Nasal CPAP at Discharge	tinyint	1	✓
	Range: 7 if [BYEAR] > 2017 and [DELDIE]=1; 0, 1, 9 if [BYEAR] > 2017 and [DELDIE]=0; Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown			

Name	Description/Range of Acceptable Values	SQL Server® Data Type	Max Length (Bytes)	Allow Nulls
DURVENT	Duration of Assisted Ventilation Range: 0, 1, 2, 3, 7, 9	tinyint	1	✓
VENTDAYS	Codes: 0=None, 1= <4 Hours, 2= 4 to 24 Hours, 3= >24 Hours, 7=N/A, 9=Unknown. Use 7 if [DELDIE]=1 Days of Assisted Ventilation Range: 2 to 367, 7777, 9999	smallint	2	✓
ECMOP	Codes: 7777=N/A, 9999=Unknown. Use 7777 if [DURVENT]=0, 1, 2, 7. Use 9999 if [DURVENT]=9 ECMO at your Hospital Range: 7 if [DELDIE]=1; 0, 1, 9 if [DELDIE]=0; Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown	tinyint	1	✓
HYPOIEP	Hypoxic-Ischemic Encephalopathy Range: 0, 1, 7, 9 Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown. Use 7 if [DELDIE]=1. Use 7 if [GAWEEKS]<36	tinyint	1	✓
HYPOIES	HIE Severity Range: 1, 2, 3, 7, 9 Codes: 1=Mild, 2=Moderate, 3=Severe, 7=N/A, 9=Unknown. Use 7 if [HYPOIEP]=0, 7. Use 9 if [HYPOIEP]=9	tinyint	1	✓
MECASP	Meconium Aspiration Syndrome Range: 0, 1, 9 Codes: 0=No, 1=Yes, 9=Unknown	tinyint	1	✓
TRCSUCMA	Tracheal Suctioning for Meconium Attempted during Initial Resuscitation Range: 0, 1, 7, 9 Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown. Use 7 if [MECASP]=0. Use 9 if [MECASP]=9	tinyint	1	✓
SEIZURE	Seizures Range: 0, 1, 7, 9 Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown. Use 7 if [DELDIE]=1	tinyint	1	✓
COOLED	Hypothermic Therapy at Your Hospital Range: 0, 1, 7, 9 Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown. Use 7 if [DELDIE]=1	tinyint	1	✓
COOLMETH	Cooling Method Range: 1, 2, 3, 7, 9 Codes: 1=Selective Head, 2=Whole Body, 3=Both Selective Head and Whole Body, 7=N/A, 9=Unknown. Use 7 if [COOLED]=0, 7. Use 9 if [COOLED]=9	tinyint	1	✓
DISCHOME	Range: 7 if [BYEAR] > 2018 and [DELDIE]=1; 0, 1, 9 if [BYEAR] > 2018 and [DELDIE]=0; Codes: 0=No, 1=Yes, 7=N/A, 9=Unknown	tinyint	1	✓
SIHTHISCENTER	Range: 1, 0. Codes: 0=No, 1=Yes.*	tinyint	1	✓
SIHOTHERCENTER	Range: 1, 0. Codes: 0=No, 1=Yes.*	tinyint	1	✓

*See **Appendix F**

Appendix B: Export File Format and Import File Format

The eNICQ 6 application is able to consume its own export files, but you may notice on inspection that the export format is not identical with the import format. The reason for this is that the export format contains numerous calculated fields and internal housekeeping fields that are not required on import. For example, it is not necessary to import the value for LOS1 or LOSTOT because those values are calculated from DOB, DOA, DID and DFD values.

There is no harm in importing a file that contains these fields. The entries will be discarded though and replaced with the results of eNICQ's calculations on import. The following list includes the most commonly seen calculated and housekeeping fields in the export format. This list is not necessarily complete and is subject to change without notice.

AgeAtAdmission
AgeAtFinalDischarge
AgeAtFinalDisposition
AgeAtInitialDischarge
AgeAtInitialDischargePlusOne
AgeAtWeek36
AgePrimaryTrackingEnds
AgePrimaryTrackingEndsPlusOne
AttemptedSubmissionDate
BYEAR
CmPerDay
CURRENTDATE
CurrentDisposition
CURRENTYEAR
DAYADMISS
DayAtMaxLengthOfStay
DaysToWeek36
Deleted
DOBPLUS1DOD28
ELIGOTHHOSP
ELIGPVL
ELIGVLBW
FinalDisposition
GramsPerDayDwgt
INHOSPDAY28
INHOSPDAY4
INHOSPWEEK36
LOS1
LOSTOT
RecordStatus
ROUNDEDGA
Submitted
Transferred
Updated
Wk36

Appendix C: Special Characters in XML File Format

In an XML document, certain characters that may be used in markup must be replaced with a reference when they appear in a block of text as a character data value. This is typically only a concern for the few data items that allow free text entry by end-users. For example, the following text content could cause trouble in an import file:

<PATIENTLASTNAME>O'Reilly<\PATIENTLASTNAME>

<NOTES>Remember that Labor & Delivery staff have outstanding documents for us to collect for this infant<\ NOTES >

<NOTES>This baby had a temperature > 37 degrees at admission<\ NOTES >

The following substitutions should be made:

Character	Example	Character Reference
Ampersand	&	&
Greater Than	>	>
Less Than	<	<
Single Quote	'	'
Double Quote	"	"

So, the above example then becomes:

<PATIENTLASTNAME>O'Reilly<\PATIENTLASTNAME>

<NOTES>Remember that Labor & Delivery staff have outstanding documents for us to collect for this infant<\ NOTES >

<NOTES>This baby had a temperature > 37 degrees at admission<\ NOTES >

These sorts of substitutions should be automated in your export routine, rather than relying on end users to understand and account for the potential conflict with special characters.

Appendix D: Handling null or empty values in XML format

Supported methods for passing Null or empty values:

The most explicit way to represent a null value in XML is to include an empty tag set for the data item.

Either of the following two entries would have the same result of wiping any existing item:

<HFNC36></HFNC36> **-or-** <HFNC36/>

Unsupported methods for passing Null or empty values:

Another way to represent a null value would be to not include the tags for that item. If a given record has no tags for a certain data item, it will be considered empty by eNICQ 6. One advantage of XML is that not all records have to even include the same set of field tags. Only the "minimum required fields" need to be present.

The disadvantage of this method is that it will not force an overwrite of the existing value if one already exists in the eNICQ 6 database. Because this method will have different results in an update scenario versus an insert scenario, we advise sticking to the more consistent method of passing an empty tag set.

Another **unsupported** way to represent a null value in XML is by using the xsi:nil attribute. W3C lists this as a legitimate option, but we do not currently support it:

<HFNC36 xsi:nil="true"/>

Apparently 'xsi:nil' requires a library or include statement that our code is currently lacking. We may extend the application to support this option in the future, but for now please use one of the supported options.

What happens when you pass empty values:

Empty values passed in via an import will strip any value that currently exists for that data item for that record. What this means in the key/value pair design is that the field is wiped completely from the database for that item for that record. There is no "HFNC36" data item for that record any longer, so there actually is no value left whatsoever.

It is because of this design aspect that we consider eNICQ 6 to be "blind" to the notion of null values. It doesn't store them at all. The absence of a data item for a given record means that there is no value, not a null or empty value, but no value whatsoever. The data item no longer exists for the record, until such time it is filled again. The eNICQ 6 application will assign a "blank" status to the data item and an "incomplete" status to the record (provided no other status applies.)

Can I fill the data item with the text "NULL" to declare it null?

No, this will NOT work: <HFNC36>NULL</HFNC36>

Appendix E: Stored Procedure prcLoadExternalData

The following stored procedure provides an example of writing to the eNICQ 6 external table. It can either be run to add it to your database, or you can use it to confirm your understanding about how to write to the external table.

It is available for download here: prcLoadExternalData

Appendix F: New Fields for 2019

In 2019, the Vermont Oxford Network will be allowing filling of three additional fields for EDI.

- DISCHOME
- SIHTHISCENTER
- SIHOTHERCENTER

The first item, DISCHOME or "Previously Discharged Home" is a new field that applies to infants at centers participating in the Expanded Database born in 2019 and later. Please verify your center's database participation before adding this item. Additionally, please see the Manual of Operations, Part II for 2019 for additional guidance on completing this item.

The second two items, SIHTHISCENTER and SIHOTHERCENTER are housekeeping fields meant to simplify the data collection and finalization process. They are not actually reported to the Vermont Oxford Network but must be answered to complete your records in eNICQ 6.

Typically, you will not know the correct, final answer to these data items until the infant is discharged or reaches a final disposition. You may choose to fill them in a time and manner that matches your own business work flow.

For example, if you do not export records to eNICQ until they are finalized, you can fill the final, correct answer at that time. Alternately, if you export your records to eNICQ 6 with only a few fields completed and fill them gradually over time, you may choose to answer these items "No" on the first round, only changing them to "Yes" if that answer becomes true at time of record finalization at the end of the year.

Your answers to these questions will change what fields are available for completion within the eNICQ application.

Answering "Yes" to either of these items will hide fields related to post-discharge care, such as ventilation therapy, enteral feedings and monitors provided at discharge.

Answering "No" to both of these items will restore the hidden discharge questions so that they can be completed.

Importing Legacy Records

Please note that records prior to 2018 will not support the import of the fields SIHTHISCENTER or SIHOTHERCENTER. This was an intended design choice to support the initial conversion of records in order to avoid overwriting existing items. The downside of this is that re-import of legacy records from 2016 or 2017 will not carry these items over. Please avoid re-import of legacy records if possible.

Please note that the legacy fields SRGLIG and SRGLIGWD are discontinued as of 2018, but are expected to be present in legacy records from 2017 or 2016. As shown in **Appendix A**, these items can be left blank or N/A filled if you include them for any 2018 or 2019 records.

New Fields for Submission in 2019 That Are Already Included in EDI

As described in the Manual of Operations, Part II for 2019, the Vermont Oxford Network is now accepting PHI data <u>only if the center is certified for PHI</u>. This refers to submissions directly to the Vermont Oxford Network (performed by eNICQ 6). For EDI import to eNICQ 6, these fields <u>have already been included in the file format in prior years</u>. These fields have always been meant to be imported via EDI. Inclusion in import to eNICQ does not mean that these items will be sent on to Vermont Oxford Network, unless you have enrolled for PHI submission.

- Date of Birth
- Date of Admission
- Date of Initial Discharge
- Date of Final Disposition