

Linking Epic to NEWT (www.newbornweight.org)

The publicly available and free to use website, www.newbornweight.org, which houses the Newborn Weight Tool (NEWT), can now be linked to Epic. NEWT is the first tool created that allows pediatric healthcare providers and parents to see how a newborn's weight during the first days following childbirth compares with a large sample of newborns. Using a research sample of birth weights from more than 100,000 breastfed newborns, the tool uses a nomogram to plot a baby's weight percentile at any given time in the first few days following birth compared with the research population. The results can be used for early identification of neonates on a trajectory for greater weight loss and related complications.

To request a demo please reach out to researchsolutions@ucsf.edu.

Downloading the Application

Search using the application's client ID (bb57cdad-5310-4b57-8c8a-c6faee1ba7ab) at fhir.epic.com/download. Request download to alert the Connection Hub point person at your organization.

Required Data Mapping

The NEWT launch requires several discrete elements to be mapped to LOINC and SNOMED codes for retrieval via FHIR APIs. **You must map these codes to values in your Epic system.** We have included instructions below on how to do this mapping but validate that you are mapping to the correct location where these data are collected in your Epic system.

1. Birth Time
 - a. Stored in I HSB 35420, I EPT 110/111, FLO 22687
 - b. Mapped to [LOINC 57715-5](#)
2. Delivery Method, Vaginal or C-Section
 - a. Stored in I HSB 35413, I EPT 19413, FLO 12124
 - b. Mapped to [LOINC 73762-7](#)
 - c. SNOMED Codes
 - i. CESAREAN DELIVERY - DELIVERED [SNOMED#200146002]
 - ii. VAGINAL DELIVERY [SNOMED#289259007]
3. Feeding method, breastmilk or formula (FLO)
 - a. Stored in custom flowsheet.
 - b. Mapped to [LOINC 67704-7](#)
 - c. SNOMED Codes
 - i. Breast Milk - BREAST MILK [SNOMED#226789007]
 - ii. Formula Milk - FORMULA MILK [SNOMED#386127005]
 - iii. Unmapped values will default to breast fed

Map Flowsheet Rows to LOINC and SNOMED Values

To allow the NEWT tool to pull the correct patient data across different systems, we must map the necessary data points to standard LOINC and SNOMED values. Mapping your data to LOINC codes ensures that we are pulling the correct data for NEWT. Mapping our data values to SNOMED ensures that even if another organization has a different set of categorical values, we can map equivalent values that NEWT understands.

Feeding Method – LOINC and SNOMED Mapping

Feeding method (breastmilk or formula) documentation will vary across organizations. In this example, we use a custom flowsheet row and map our organization specific values to LOINC and SNOMED codes that NEWT is expecting. You will use a different flowsheet and need to identify where at your organization this information is documented.

LOINC Mapping

In Doc Flowsheet Builder, open your flowsheet and navigate to Concept Mapping. The entire row should be mapped to **LOINC 67704-7**, while the values at your organization that map to exclusively breast feeding will be mapped to **SNOMED#226789007** and exclusively formula fed to **SNOMED#386127005**.

The screenshot displays the 'Flowsheet Group/Row - R ICN DIET TYPE [3040002111] (Version Released)*' interface. On the left, a tree view shows the 'Current Version' expanded to 'Concept Mapping'. The main area is divided into two sections: 'Row concept mapping' and 'Value concept mapping'.

Row concept mapping:

Concept
1 LOINC 67704-7 [LOINC#67704-7]
2

Value concept mapping:

Value	Concept
1 Breastfeeding	1 BREAST MILK [SNOMED#226789007]
2 Formula - Bottle	2
3 Breast Milk - Bottle	
4 Tube Feeding	
5 NPO	
6 Oral Care	
7 Other (Comment)	
8 Alternative Method for Breastfed Baby	
9 Exclusive Formula Fed Infant	
10 Infant Driven Feeding Scale	
11	

Delivery Method - LOINC and SNOMED Mapping

Delivery method is often captured via Stork SmartForms and then stored in an HSB/EPT item. To make this available to NEWT we need to store that data in a flowsheet and map that flowsheet to the appropriate LOINC/SNOMED values. At UCSF, we also have a flowsheet where delivery method is stored (FLO 12124). If your organization does not have a flowsheet for delivery method, you will need to create one.

LOINC Mapping

In Doc Flowsheet Builder, open your flowsheet and navigate to Concept Mapping. The entire row should be mapped to **LOINC 73762-7**. For value concept mapping, your organization's value(s) for cesarean delivery should be mapped to **SNOMED#200146002** and vaginal delivery value(s) mapped to **SNOMED#289259007**.

Birth Time – LOINC Mapping

Birth Time is often captured via Stork SmartForms and then stored in an HSB/EPT item. To make this available to NEWT we need to store that data in a flowsheet and map that flowsheet to the appropriate LOINC value. At UCSF, we also have a flowsheet where birth time is stored (FLO 22687). If your organization does not have a flowsheet for birth time, you will need to create one.

LOINC Mapping

In Doc Flowsheet Builder, open your flowsheet and navigate to Concept Mapping. The entire row should be mapped to **LOINC 57715-5**. As this data is not categorical there is no need for SNOMED value mapping.

Create Extensions to Map HSB Values to Flowsheets

Depending on where these values are being documented at your organization, you may need to connect other data sources to your mapped flowsheet rows. For example, at our organization Birth Time and Delivery Method are documented in SmartForms that file their values to the episode and EPT record. We need to create an after-file extension that saves the value in the SmartForm to our flowsheet.

Birth Time – Extension Mapping

At our organization, Birth Time is documented via an RN Newborn Delivery SmartForm. To get data from the SmartForm to file to our flowsheet, we need to create a copy of Epic released LPP 15121 – OB Delivery: File to Flowsheets.

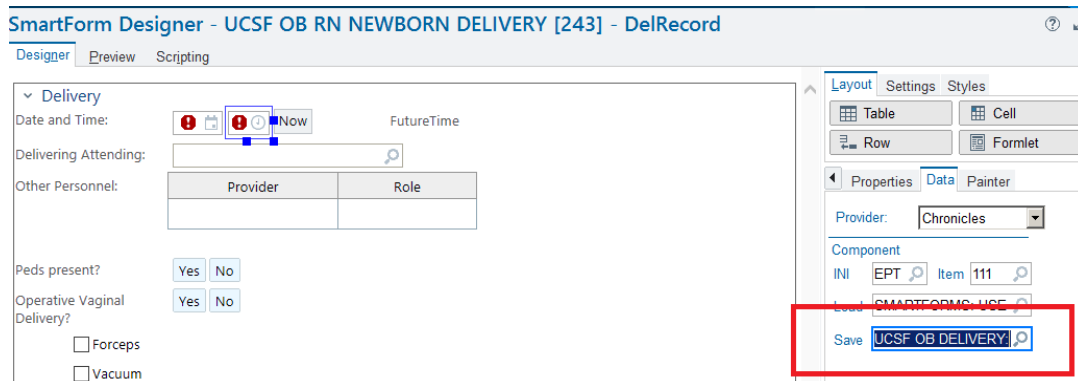
Once you have a copy of the extension, replace the flowsheet identifier with your organization’s flowsheet for Birth Time (in our example, FLO 22687):

The screenshot displays the configuration for an extension named "UCSF OB DELIVERY: FILE TO FLOWSHEETS - BIRTH TIME [100242]". The configuration includes the following fields:

- Name:** UCSF OB DELIVERY: FILE TO FLOWSHEETS - BIRTH TIME
- Type:** SmartForm Saving [57000]
- Code:** \$\$fileToFLO*OBDELPP3(id,.vals, "", "22687")
- Comments:** Extension records of the type 57000-SmartForm Saving are called when data on SmartForms is saved. This extension is designed to allow the baby's data (such as birth weight) filed from Stork's Delivery Summary to also update a flowsheet row in the baby's chart. When the Delivery Summary is saved, data will file to a reading in the specified flowsheet at the time and date of delivery.
- Code template:** OB DELIVERY BABY FILE TO FLOWSHEET BIRTH WEIGHT [150189]
- Parameters:** A table with columns "Name" and "Value".

Name	Value
Patient ID	id
DELIVERY SUMMARY DATA	.vals
FLOWSHEET IDENTIFIER	<input type="text"/>
FLO ID	R UCSF BIRTH TIME [22687] R UCSF BIRTH TIME [22687]

Step two is to open the SmartForm where this is documented using the SmartForm Designer. Navigate to the field where Birth Time is documented, then open the “data” tab. Here you should be able to enter an after-save extension that runs when data is saved to this field. Enter your new extension:



Delivery Method – Extension Mapping

At our organization, Delivery Method is documented via an MD Newborn Delivery SmartForm. To get data from the SmartForm to file to our flowsheet, we need to create a copy of Epic released LPP 15121 – OB Delivery: File to Flowsheets.

Once you have a copy of the extension, replace the flowsheet identifier with your organization’s flowsheet for Delivery Method (in our example, FLO 12124).

Step two is to open the SmartForm where this is documented using the SmartForm Designer. Navigate to the field where Delivery Method is documented, then open the “data” tab. Here you should be able to enter your new after-save extension that runs when data is saved to this field.

Create your Integration Configuration (FDI)

Now that your data elements are mapped, create an integration record to display NEWT in your system. Open the Web Integration activity and create and name a new Integration (“NEWT on FHIR Launch”).

Configure your new record with the following settings:

Testing Environments:

Integration Type: Smart on FHIR

URL: https://newbornweight-test.vmhost.psu.edu/ucsf/launch.html

Client ID: 7b21f459-97ba-4cb5-b906-42043a356a11

Launch Type: Workspace

Authentication Method: Smart on FHIR

Production Environment:

Integration Type: Smart on FHIR

URL: https://newbornweight-new.vmhost.psu.edu/ucsf/launch.html

Client ID: bb57cdad-5310-4b57-8c8a-c6faee1ba7ab

Launch Type: Workspace

Authentication Method: Smart on FHIR

Most organizations will also need ensure that this URL is allow listed for their Epic environments

Create your Activity (E2N)

Duplicate the Epic released activity MR_CLINKB_ENCOUNTER_SELECT

Open your copy and configure as follows:

Activity descriptor: NEWBORN_WEIGHT_TOOL

Menu type: Item

Caption: Newborn Weight Tool

Tooltip: Newborn Weight Tool (NEWT)

Style: 128

Form Style: 2105344

Create your Menu (E2U)

Create and name a new Menu (E2U) record in Chronicles (i.e. “NEWBORN_WEIGHT_TOOL”)

Configure your menu as follows:

Menu descriptor: NEWBORN_WEIGHT_TOOL

Menu type: Item

Available to Applications: DESKTOP

Caption: Newborn Weight Tool

Toolbar Tooltip: Newborn Weight Tool (NEWT)

Activity descriptor: <Your copy of MR_CLINKB_ENCOUNTER_SELECT>

URL by FDI: <Your Integration Configuration from Above>

Add your menu to Hyperspace in an appropriate place in your clinicians’ workflow (refer to the Build the Web Application into Your Chosen Workflow section of the Epic reference

below)

Epic Reference: [Integrating External Web Applications into Epic Setup and Support Guide](#)