



Extracorporeal Life Support Organization (ELSO)

**ELSO Registry Data Definitions
05/17/2022**

**For all comments, questions and concerns please email
registrysupport@elso.org**

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Preface

This document is intended to assist data entry and identify definitions for each field. This document is organized into the sections and subsections that exist on the database registry. We also attempt to identify if fields will be incorporated in mandatory fields or major complication fields by highlighting those data elements.

Descriptions of fields in this document

Field Name is the name of the variable as it appears in the online application at www.ELSO.org.

Definition/ Explanation/ Example provides the definition of the variable with an explanation of the how to collect the variable and, when appropriate, an example of choosing the correct data collection

Data Entry Rules refers to formatting rules for data entry and any warnings or restrictions on data entry. For example, the user will receive a **Soft Notification** or warning when entering data that falls outside common values or if that value could represent a more common entry in a different unit. The warning does not necessarily mean data has been entered incorrectly; it is just an opportunity for the user to double check data entry. The data enterer will receive a **Hard Limit** when data is restricted from entry. This means ELSO assesses the value to be incorrect. For example, the entry of ECLS Start Time after the Date of Death is not allowed. Occasionally it is necessary for Data Entry Rules to vary by age group in ELSO. There are three mutually exclusive ELSO age groups: **Neonate** (0-28 days), **Pediatric** (29 days- 17 years), and **Adult** (≥ 18 years). The **Soft Notification** for the **Field Name** "Admission Weight" is different for each age group. (The possibility of error exists; please email RegistrySupport@elso.org if an unwarranted Hard Limit is received).

Collection / Modification describes the dates during which the data has been collected. If there was a modification of the method by which a variable is collected, the date when that modification occurred is noted here.

Table Name is a descriptor that provides the name of the table in which a given variable is stored. ELSO data is a relational database, meaning that different data elements are stored in different tables with common rows that allow merging of tables.

Column Name / Stored Values describes the column or variable name and stored values for a given variable. For example, the data field "**Hand Bag Valve Ventilation**" is stored under Column Name (or variable name) "**HandBagging**." Handbagging has the and is stored with values "**No = 0**", "**Yes = 1**", and "**Unknown = -1**."

Historical dates

Hard and Soft Limits were first added to data elements October 16, 2018

ECPR Addenda was updated from Version 1 to Version 2 January 21, 2020

SARS-CoV-2 Addenda was added March 2, 2020

*Please see the **ELSO Registry Change Document** for more details:*

<https://www.elso.org/Portals/0/Files/PDF/January%202020%20ELSO%20Registry%20Change%20Document.pdf>

Mandatory Fields and Major Complications

We indicate mandatory fields in two ways. First, the box for the **Field Name** has a red background (see below). Second, the **Definition/ Explanation/ Example** includes the sentence “**This is a required field.**” See example below:

**Mandatory
Data Field**

Major complications

We indicate major complications by shading the background of the **Field Name** yellow. See example below:

**Major
Complication**

Extracorporeal Life Support Organization (ELSO) Registry Data Definitions

When is it Extracorporeal Life Support?

- ECLS is a collective term for extracorporeal therapies used for the support of various presentations of cardiac and/or pulmonary failure through the use of an extracorporeal circuit. *ECLS includes therapies focusing on oxygenation, carbon dioxide removal, cardiac support, or a combination thereof. It excludes cardiopulmonary bypass for cardiothoracic or vascular surgical procedures.*
- ECMO is the provision of oxygen and carbon dioxide exchange through the use of an extracorporeal circuit consisting minimally of a blood pump, artificial lung, and vascular access cannulae, using blood flows sufficient to support oxygenation and concomitantly enhance carbon dioxide removal. *The term ECLS has been used interchangeably with the term ECMO, but ECMO is the preferred term when the goal is oxygen and carbon dioxide exchange by means of a pumped extracorporeal circuit. ECMO is a type of ECLS.*
- ECLS begins when extracorporeal flow is established through the ECLS cannulas and circuit.
- Cardiopulmonary bypass may be converted to ECLS support. In this case ECLS begins when extracorporeal support is moved from the cardiopulmonary bypass circuit to an ECLS circuit.
- If a patient is on a Ventricular Assist Device and an oxygenator is placed in line, this designates the beginning of ECLS and more specifically ECMO.
- ECLS may be for short periods of time, for example to support a surgical procedure, where the patient is reliant upon the ECLS circuit.

When is it not ECLS?

- The use of a Ventricular Assist Device *without* an oxygenator is not considered ECLS.
- Currently ELSO is not collecting data on those patients who are placed on an extracorporeal circuit for organ donation.

Notes

- It is essential that every ELSO member center submit all cases that meet our definition of ECLS.
- The ELSO Registry Data Definitions is a working document. If your Center has a question or requires clarification, please contact ELSO. The answer will be found for your question and the document updated as needed.
- If you find a mistake, please contact ELSO.
- If you have an unusual patient occurrence and require assistance with categorizing or determining which forms to complete, please detail the situation to ELSO.

1. ADD PATIENT

Arrive here by clicking “Quick add.” Only select “Quick add” to enter a new patient with no previous runs. If the patient has had a previous run, select the patient and “Add new run.”

Patient Information

This section is used for starting a form and holding a form for an individual patient. These fields are required.

Field Name	Definition/ Explanation/ Example	Data Entry Rules	Collection / Modification	Table Name	Column Name / Stored Values
Center ID	<p>The Center ID is a 3 digit number assigned to your center when you join ELSO. This number will not change as long as you are an ELSO center.</p> <p>You do not need to enter your Center ID during data entry as it is linked to your account. Please note, however, that the Center ID is a component of the Unique ID below.</p> <p>Example Center ID 008</p>		01/01/1989-present	<p>Registry.CenterPatients (links CenterId and Patient Id only)</p> <p>Registry.Centers (contains all CenterNo’s)</p>	CenterNo
Unique ID	<p>The Unique ID is a number that uniquely identifies every patient in the ELSO registry. This is a required field.</p> <p>The format that must be used for this field is a ten-character identifier. The first 3 or 4 characters are the Center ID. The next 4 characters are the year the patient went on ECLS for their first run. The following 3 characters is the sequence number of that patient for that year within your center. For those patients with multiple runs, this number will be the same. <i>Please use leading zeros if any of the components are less than 3 digits.</i></p> <p>For example, if your center ID is 008, the year the patient went on for their first run of ECLS is 2011, and they are the third patient to go on ECMO the Unique ID would be: 0082011003.</p>	Ten or Eleven digit number	<p>01/01/1989-present</p> <p>4 digit center number allowed 2022</p>	Registry.Patients	UniqueID

Patient Information (continued)

This section is used for starting a form and holding a form for an individual patient. These fields are required.

Field name	Definition/ Explanation/ Example	Data Entry Rules	Collection / Modification	Table Name	Column Name / Stored Values
Birthdate	<p>This field collects the date of birth of the patient. For neonatal patients, it also collects the time of birth. This is a required field.</p> <p>Enter the patient's date of birth in format MM/DD/YYYY. If the patient is a new neonate, use the format MM/DD/YYYY HH:MM. The dates and times can be typed in or selected from a drop down menu.</p> <p>For example, if your patient was born January 9th, 2016, you would enter 01/09/2016. If they were a neonate born on October 15th, 2016 at 03:00 AM then you would enter 10/15/2016 03:00 AM.</p>	<p>Neonates (0-28 d) MM/DD/YYYY HH:MM</p> <p>Pediatric (29 d – 17 yrs) & Adult (≥ 18 yrs) MM/DD/YYYY</p> <p>Soft Notification You can leave this patient's birthdate as is, but please double check the entry as this patient is over 70 years old.</p> <p>Hard Limit The date of birth must be before the date and time on ECMO.</p> <p>The patient cannot be more than 100 years old.</p>	<p>01/01/1989-present</p>	Registry.Patients	Birthdate
Sex	<p>This field collects the gender of the patient at birth.</p> <p>Select the patient's gender at birth as Male, Female, Unknown.</p> <p>For example, if the patient was born male, then you would select "Male" from the dropdown menu.</p>	<p>This field is limited to a single value.</p> <p>This is part of the minimum dataset because it is incorporated into risk adjustment models.</p>	<p>01/01/1989-present</p> <p>8/9/2018-present Sex made part of the min dataset</p>	Registry.Patients	<p>Sex</p> <p>0 = Unknown 1 = Male 2 = Female</p>

Patient Information (continued)

This section is used for starting a form and holding a form for an individual patient. These fields are required.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/Modification	Table Name	Column Name / Stored Values
Race	<p>This field indicates the patient's race, as determined by the patient or family and can fall into one or more of the categories below.</p> <p>Check all that apply:</p> <p>Asian: This includes a person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent including, for example, Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, the Philippine Islands, Thailand, Vietnam, Japan, etc.</p> <p>Black: This includes a person having origins in any of the black racial groups, for example African American, Jamaican, Haitian, Nigerian, Ethiopian, Somali, etc.</p> <p>Hispanic, Latino, or Spanish origin – This includes a person having origins identified as Mexican or Mexican American, Puerto Rican, Cuban, Salvadoran, Dominican, Colombian, etc.</p> <p>Middle Eastern or North African for example, Lebanese, Iranian, Egyptian, Syrian, Moroccan, Algerian, etc.</p> <p>Native American: A person having origins in any of the original peoples of North and South America (including Central America), for example, Navajo Nation, Blackfeet Tribe, Mayan, Aztec, Native Village of Barrow Inupiat Traditional Government, Nome Eskimo Community, etc.</p> <p>Native Pacific Islander: A person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands, for example, Native Hawaiian, Samoan, Chamorro, Tongan, Fijian, Marshallese, etc.</p> <p>White: A person having origins identified German, Irish, English, Italian, Polish, French, etc.</p> <p>Other: Persons who define their race differently than the above choices.</p> <p>Unknown: The race of the patient is unknown</p> <p><i>If a patient identifies their race as a combination of white and black, then please check both white and black.</i></p>	Check all that apply	<p>01/01/1989-12/01/2017 defined as</p> <ul style="list-style-type: none"> ● Asian ● Black ● Hispanic ● White ● Other <p>12/01/2017-present Added:</p> <ul style="list-style-type: none"> ● Middle Eastern or North African ● Native American ● Native Pacific Islander ● Unknown <p>Changed data field from “pick one” to “check all that apply”</p>	ECLS.PatientsRaces	<p>Race</p> <p>0 = Unknown 1 = Asian 2 = Black 3 = Hispanic 4 = White 5 = Middle Eastern or North African 6 = Native American 7 = Native Pacific Islander 9 = Other</p>

First Run Information

This section includes further details regarding the patient demographics. Verify previously entered data when starting the form.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/Modification	Table Name	Column Name / Stored Values
ECLS Start Time	<p>Enter the Date/Time ECLS was initiated. This is a required field.</p> <p>This field specifically refers to the time that extracorporeal blood flow was established through cannulas attached to an ECLS circuit.</p> <p>ECLS Start time may also be the date/time a patient who was previously placed on ECLS in another institution was admitted to your institution. Please enter transfer details in the field name "Patient Transported on ECMO" under Pre-ECLS Support.</p> <p>VAD circuits that have an oxygenator: consider the start time of ECLS as the time the oxygenator was added.</p> <p>Patient X was transported on ECLS to My State Hospital B on January 12, 2017 16:00. Patient X was cannulated for ECLS at University Hospital A and ECLS flow was established on January 11, 2017 at 14:00. My State Hospital B is filling out the ELSO data entry form and will record ECLS start time as 01/12/2017 4:00PM.</p>	<p>DD/MM/YYYY HH:MM</p> <p>Hard Limit Time On cannot be earlier than the Date of Birth.</p> <p>Time On cannot be after than the Date of Death.</p>	01/01/1989-present	ECLS.Run	TimeOn (computed by IGD as TimeOn for earliest RunDetail record)
Run No	<p>The number reflecting how many ECLS runs this patient has had in their lifetime. This is a required field and it is auto-populated if you click new run.</p> <p>The first time a patient is placed on ECLS is considered Run #1. Patients should have additional Runs entered due to: removal of ECMO cannulas AND cessation of ECMO support for a time period greater than 12 hours.</p> <p>However, when a VAD is in use, cannulas may be left in once the oxygenator is removed. Consider adding an additional run after 12 hours has elapsed from the removal of the oxygenator.</p> <p>Temporary transition of ECLS Support to cardiopulmonary bypass (CPB) for cardiac surgery would not be categorized as an additional run. Nor do changes in "ECLS Mode" such as from VA to VV do not constitute a new run in isolation.</p>	<p>If this is the first run click "Quick Add" and Run No 1 will be auto-populated. If this is Run No 2 or greater then select the desired patient and click "Add New Run". The next consecutive run will be auto-populated.</p>	01/01/1989-present	ECLS.Runs	RunNo

	<p>Patient X was discontinued from ECLS on February 2, 2017 at 2:00 AM, but his cannulas were left in place. He required ECLS support to be restarted on February 2, 2017 at 4:00PM (14 hours later). This is not a new run because the ECLS cannula were not removed.</p> <p>Patient Y was discontinued from ECLS on March 4, 2017 at 03:00 AM and the cannulas were removed. He required ECLS again on March 4, 2017 at 4:00 PM (13 hours later). This is a new run because cannulas were removed and it was greater than 12 hours later.</p>				
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First Run Information (continued)

This section includes further details regarding the patient demographics. Verify previously entered data when starting the form.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/Modification	Table Name	Column Name / Stored Values
Support Type	<p>This field defines the Support Type of ECLS received. ECLS Support Types are (pulmonary, cardiac and ECPR). This is a required field.</p> <p>Select the best choice.</p> <p>Pulmonary: The use of extracorporeal membrane oxygenation with a primary indication for support of respiratory failure by providing gas exchange support. Does not imply any specific ECLS mode or cannulation configuration. (Synonym for respiratory ECMO.)</p> <p>Cardiac: The use of extracorporeal membrane oxygenation with a primary indication for support of left and/or right ventricular failure by providing cardiac and gas exchange support. Does not imply any specific ECLS mode or cannulation configuration.</p> <p>Extracorporeal cardiopulmonary resuscitation (ECPR): ECPR is the application of rapid-deployment venoarterial extracorporeal membrane oxygenation, to provide circulatory support in patients in whom conventional cardiopulmonary resuscitation (CPR) is unsuccessful in achieving sustained return of spontaneous circulation (sustained ROSC). Sustained ROSC is deemed to have occurred when chest compressions are not required for 20 consecutive minutes and signs of circulation persist (Jacobs et al, Cardiac arrest and CPR outcome reports: Utstein templates from ILCOR. <i>Circulation</i>. 2004;110(21):3385-972004).</p> <p>Patient X, a 3 year-old, suffered a cardiac arrest during intubation for an asthma exacerbation. He achieved return of spontaneous circulation (ROSC). He was on continuous albuterol and 0.1mcg/kg/min of epinephrine and echocardiogram demonstrated hyperdynamic cardiac function. He was placed on VA ECMO through the neck for respiratory support. Choose support type Pulmonary.</p> <p>Patient Y, a 55 year-old, suffered a cardiac arrest after a myocardial infarction. He achieved ROSC, but an hour later had poor LV function and rapidly progressive needs for inotropic support. He was cannulated VA through the groin for cardiac support. Choose support type Cardiac.</p> <p>Patient Z, a 50 year-old, suffered ventricular fibrillation cardiac arrest. In the next 60 minutes, he required a cumulative of 55 minutes of CPR interrupted by moments (< 5minutes) of ROSC. When ECLS cannulas were placed, he was not receiving CPR, but arrested again immediately after placement. He was cannulated VA. Choose support type ECPR.</p>		01/01/1989-present	ECLS.Runs	SupportType 1=Pulmonary 2=Cardiac 3=ECPR

First Run Information (continued)

This section is further details regarding the patient demographics. Verify previously entered data when starting the form.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/Modification	Table Name	Column Name / Stored Values
ECLS Mode	<p>This field defines the mode of drainage and return of blood in the extracorporeal system. This is a required field.</p> <p>Select the primary cannulation configuration even if multiple cannulas are placed.</p> <p>VV: Venovenous support is the application of extracorporeal circulation primarily for respiratory support, in which the extracorporeal circuit drains blood from the venous system and reinfuses into the venous system (or pre-lung). VV ECMO operates in series with the heart and lungs and does not provide bypass of these organs.</p> <p>VA: Venoaerterial is the application of extracorporeal circulation often for cardiac or circulatory support, in which the extracorporeal circuit drains blood from the venous system and returns into the systemic arterial system. Without qualification, VA ECMO refers to support that returns blood to the systemic arterial system, operating in parallel with and providing partial, or complete, bypass of the heart and lungs.</p> <p>VVA Venovenoarterial is a hybrid configuration of VV and VA extracorporeal support in which the extracorporeal circuit drains blood from the venous system and reinfuses into both the venous and systemic arterial systems. VVA ECMO provides both pulmonary (VV component) and cardiac support (VA component) in patients with combined cardiopulmonary failure.</p> <p>VP: Venopulmonary is the application of extracorporeal circulation for combined respiratory and right heart support in which the extracorporeal circuit drains blood from the venous system and reinfuses into the pulmonary artery. VP ECMO provides partial or complete bypass of the right heart but operates in series with the lungs.</p> <p><i>Conrad, S, et al (2018) The Extracorporeal Life Support Organization Maastricht treaty for nomenclature in extracorporeal life support. Am J Respir Crit Care Med, 198(4), 447-451</i></p>		<p>01/01/1989-present</p> <p>Venopulmonary Mode 07/12/2020 - present</p>	<p>ECLS.RunDetails</p> <p>(Reporting Notes: 1. We will consider a Run VV à VA if and only if there are two run detail records: the first having VV, the second having VA. 2. We will consider a Run VA à VV if and only if there are two run detail records: the first having VA and the second having VV. 3. Any situation having more than 2 run details with different values of Mode will be considered as Support Mode = Other}</p>	<p>Mode</p> <p>(See ECLS.ModeCodes for X-Walk table)</p> <p>1 = VA 2 = VV 3 = VVA 4 = AVCO2R 5 = VVECCO2R 6 = VP 0 = Unknown 9 = Other</p>

First Run Information (continued)

This section is further details regarding the patient demographics. Verify previously entered data when starting the form.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/Modification	Table Name	Column Name / Stored Values
ECLS Mode	<p><i>Broman LM, et al (2019) The ELSO Maastricht Treaty for ECLS nomenclature: abbreviations for cannulation configuration in extracorporeal life support. A position paper of the Extracorporeal Life Support Organization. Crit Care 23(1), 36. Doi: 10.1186/s13054-019-2334-8.</i></p> <p>AVCO₂R Arteriovenous carbon dioxide removal (AVCO₂R) is the provision of pumpless carbon dioxide exchange through the use of an extracorporeal circuit consisting of an artificial lung, and venous and arterial vascular access cannulas using lower blood flows. Blood flow is driven by the patient’s arterio-venous pressure gradient.</p> <p>VV ECCO₂R Venovenous extracorporeal carbon dioxide removal (VV CO₂R) is the provision of carbon dioxide exchange through the use of an extracorporeal circuit consisting of a blood pump, artificial lung, and venovenous vascular access cannulas using lower blood flows.</p> <p>Other Indicates a support not listed</p> <p>Unknown</p> <p>Patient W, a 10-year old requiring ECMO for respiratory support was placed with a dual-lumen ECMO cannula in the right internal jugular vein, and a second single lumen draining cannula. Choose VV.</p> <p>Patient X, returns from the Cardiovascular Operating Room (CVOR) after scheduled RVAD implantation (right atrium to pulmonary artery). Because the patient’s implantation was complicated by pulmonary hemorrhage, the patient requires an oxygenator to be placed in line with the RVAD circuit. Choose VP.</p>				

Neonatal Information

This section is completed for all neonatal patients. Neonatal is a patient defined as less than or equal to 28 days of age at ECLS Start Time.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/Modification	Table Name	Column Name / Stored Values
Birth Weight	<p>This field collects the weight of the patient at the time of birth. This is a required field if the patient age is ≤ 28 days at ECLS Start Time.</p> <p>Enter the patient's weight at birth in kilograms to the nearest hundredth.</p> <p>Baby A was born at 3.157kg and went on ECMO weighing 3.210kg. Please enter Birth Weight 3.16 kg</p>	<p>Values can be entered to two decimal points (hundredths)</p> <p>Soft Notification: < 2.00 kg or > 6.00 kg</p> <p>Hard Limit: <0.20 kg or > 10.00 kg</p>	01/01/1989-present	Registry.Patients	BirthWeight
Gestational Age	<p>Enter the patient's estimated gestational age at birth in weeks. This is a required field if the patient age is ≤ 28 days at ECLS Start Time.</p> <p>Enter the gestational age at birth in weeks to the nearest tenth.</p> <p>Baby B was born October 10, 2017 at 38 and 2/7th weeks gestation. Enter 38.3 because 2/7 = 0.286</p>	<p>Values can be entered to one decimal points (tenths)</p> <p>Hard Limit: <12 weeks or > 50 weeks</p>	01/01/1989-present	Registry.Patients	GestAge
Apgar 1	<p>This field collects the 1 minute Apgar scores.</p> <p>One minute Apgar scores can have a value from 0 through 10.</p> <p>Baby B was born with Apgar scores 7/9 (common short hand for Apgar score at 1 minute = 7 and Apgar score at 5 minute = 9). Please enter 7 for the Apgar 1.</p>	<p>Integer values only</p> <p>Hard Limit: < 0 or > 10</p>	01/01/1989-present	Registry.Patients	Apgar1
Apgar 5	<p>This field collects the 5 minute Apgar scores.</p> <p>Five minute Apgar scores can have a value from 0 through 10.</p> <p>Baby B was born with a five minute Apgar score of 9. Please enter 9 for the Apgar 5.</p>	<p>Integer values only</p> <p>Hard Limit: < 0 or > 10</p>	01/01/1989-present	Registry.Patients	Apgar5
Delivery	<p>This field collects the patient's delivery type.</p> <p>Select one: Vaginal, Emergency Caesarian Section, Elective Caesarian Section or Unknown</p> <p>Baby A was emergently delivered via Caesarian section due to non-reassuring fetal heart tones. Select Emergency Caesarian Section.</p>		01/01/1989-present	Registry.Patients	<p>Delivery</p> <p>0 = Unknown 1 = Vaginal 2 = Emergency C-Section 3 = Elective C-Section</p>

CDH Information					
Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/Modification	Table Name	Column Name / Stored Values
CDH	<p>This field collects if a neonate had a congenital diaphragmatic hernia (CDH). CDH is a developmental defect of the diaphragm that allows abdominal viscera to herniate into the chest. This defect is present from the time of birth.</p> <p>Select one: Yes, if the patient has a CDH No, if the patient did not have a CDH Unknown, if it is not known whether the patient has a CDH</p> <p>Baby A was born with a left sided CDH. Select yes from the drop down for CDH.</p>		01/01/1989-present	Registry.Patients	CDH -1 = Unknown 0 = No 1 = Yes Missing = Null
Prenatal CDH	<p>This field collects if a neonate had a prenatal diagnosis of a congenital diaphragmatic hernia (CDH).</p> <p>If the patient was known to have CDH, please select one. Yes, if CDH was prenatally diagnosed No, if CDH was first recognized after birth (postnatally) Unknown, if clinicians did not know whether the patients CDH diagnosis was made prenatally or postnatally.</p> <p>Baby A was born with a prenatally diagnosed left sided CDH. Select yes from the drop down for prenatal CDH.</p>		01/01/1989-present	Registry.Patients	CDHPrenatal -1 = Unknown 1 = Yes 0 = No Missing = Null
CDH Side	<p>This field collects the laterality (side) of a neonate's congenital diaphragmatic hernia (CDH).</p> <p>Select the drop down choice that identifies the CDH laterality. Right, if CDH was only on the anatomic right side (side of liver) Left, if CDH was only on the anatomic left (side of spleen) Bilateral, if CDH was on both sides Unknown, if clinicians do not know the laterality of the CDH.</p> <p>Baby A was born with a right sided CDH. Select CDH Side=Right.</p>		01/01/1989-present	Registry.Patients	CDHSide 0 = Unknown 1 = Left 2 = Right 3 = Bilateral Missing = Null

CDH Information (continued)					
Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/Modification	Table Name	Column Name / Stored Values
Repair of CDH	<p>This field describes the timing of the surgical repair of the CDH.</p> <p>Select the best choice from the drop down that identifies the first surgical attempt to correct the CDH.</p> <p>Pre-ECLS: CDH surgical repair performed prior to the ECLS Start Time.</p> <p>On ECLS, CDH surgical repair performed after the ECLS Start Time.</p> <p>Post-ECLS: CDH surgical repair performed after ECLS Stop Time.</p> <p>None: The patient did not receive surgical repair of the CDH.</p>		01/01/1989-present	Registry.Patients	CDHRepair 0 = None 1 = Pre-ECLS 2 = On ECLS 3 = Post-ECLS

2. RUN INFORMATION

This section details a specific run on ECLS and may be repeated for different runs.

Run Info					
Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/Modification	Table Name	Column Name / Stored Values
Run No	Enter the number reflecting how many ECLS runs this patient has had in their lifetime. This a required field. First Run Information under Run No		01/01/1989-present	ECLS.Runs	RunNo
Support Type	This field defines the Support Type of ECLS received. ECLS Support Types are (pulmonary, cardiac and ECPR). This is a required field. First Run Information under Support Type		01/01/1989-present	ECLS.Runs	SupportType 1 = Pulmonary 2 = Cardiac 3 = ECPR
Admission Weight	This field collects the patient's weight at the time of admission to the hospital providing ECLS. Use admission weight at the time of admission to the ECMO institution. Enter the weight in kilograms to the nearest hundredth of a kilogram for neonates. Enter the weight to nearest tenths for pediatric and adult patients. As this is part of the minimum dataset, if this information is unknown or unavailable check the appropriate box. Neonate admitted to your hospital 4.57 kg and weighing 3.95 kg at birth. Record the admission weight of 4.57 kg.	<p>Neonate (0-28 d) Values can be entered to two decimal points Soft Notification: < 2.00 kg or > 6.00 kg Hard Limit: <0.20 kg or > 10.00 kg</p> <p>Pediatric (29 d - 17 yr) Values can be entered to one decimal point Soft Notification: < 2.0 kg or > 125.0 kg Hard Limit: < 1.0kg or > 500.0 kg</p> <p>Adult (≥ 18 yr) Values can be entered to one decimal point Soft Notification: < 35.0kg or > 125.0 kg Hard Limit: < 10.0 kg or > 500.0 kg</p> <p>This is part of the minimum dataset because it is incorporated into risk adjustment models.</p>	01/01/1989-present 8/9/2018-present Admission Weight made part of the minimum dataset	ECLS.Runs	Weight

Run Info (continued)					
Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/Modification	Table Name	Column Name / Stored Values
Admission Height	<p>This field collects the patient's height at the time of admission to the hospital delivering ECLS</p> <p>Enter the height in centimeters to one decimal place.</p> <p>Patient J's admission height was 60 inches. In this case, convert to centimeters (152.4 cm). Record Height = 152.4 cm.</p>	<p>Values can be entered to one decimal point.</p> <p>Neonate (0-28 d) Soft Notification: < 45 cm or > 55 kg Hard Limit: < 30 cm or > 70 cm</p> <p>Pediatric (29 d - 17 yr) Soft Notification: < 45 cm or > 190 cm Hard Limit: < 30 cm or > 250 cm</p> <p>Adult (≥ 18 yr) Soft Notification: < 150 cm or > 190 cm Hard Limit: < 70 cm or > 250 cm</p>	10/01/2016-present	ECLS.Runs	Height

Run Info (continued)					
Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/Modification	Table Name	Column Name / Stored Values
Intubation	<p>This field collects information on the placement of an artificial airway (nasal/oral endotracheal tube or new tracheostomy tube) at any point during the patient's hospitalization.</p> <p>Please select best choice: No: If the patient never had an endotracheal tube during hospitalization. The hospitalization refers to the time spent at the hospital providing ECLS and any other preceding hospitals during the episode of care that led to ECLS.</p> <p>Yes date/time known, or Yes date/time estimated, or Yes date/time unknown: If this patient had a newly placed endotracheal tube or a new tracheostomy tube during the hospitalization. The hospitalization refers to the time spent at the hospital providing ECLS and any other preceding hospitals during the episode of care that led to ECLS. Select Yes date/time known if the date and time is known. Select Yes date/time estimated if the date and time can be estimated to within a day but the exact time is unknown. Select Yes date/time unknown if the date and time is not known and cannot be estimated.</p> <p>Pre-existing tracheostomy: If patient was admitted to the hospital with a pre-existing tracheostomy tube.</p> <p>Patient T has a past medical history of airway stenosis and tracheostomy dependence. He is on room air at home. Select pre-existing tracheostomy tube from the drop down.</p> <p>Patient S was admitted to Hospital A and intubated on 10/01/2017 before being transported to Hospital B for ECLS evaluation on 10/06/2017. Select yes from the drop down.</p>		<p>12/01/2017-present</p> <p>8/6/2018-present No value, known date/time, Pre-existing tracheostomy, Unknown date/time, Estimated date/time or No intubation added</p>	ECLS.Runs	<p>IntubationSelected</p> <p>New date/time known = 1 Pre-Existing invasive ventilation = 2 Yes, date/time unknown = 3 Yes, date/time estimated = 4 No = 0</p>

Run Info (continued)					
Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/Modification	Table Name	Column Name / Stored Values
Intubation Date/Time	<p>This field collects the date and time of the newly placed artificial airway (nasal/oral endotracheal tube or new tracheostomy tube).</p> <p>Enter the date and time (DD/MM/YYYY HH:MM) that the patient had an artificial airway placed. This may be pre- or on ECMO. Intubation refers to placement of an artificial airway, whether it is an endotracheal, nasotracheal or tracheostomy tube.</p> <p>Patient O had an orotracheal intubation on 10/01/2017 11:30 AM and a tracheostomy on 10/7/2017 at 12:45 PM. Please enter 10/01/2017 11: 30 AM.</p>	<p>Soft Notification: You can leave Intubation Date as is, but it is unusual for this date to be AFTER the time on ECLS Start Time.</p> <p>You can leave Intubation Date as is, but it is unusual for this date to be more than a month before the time on ECLS Start Time.</p> <p>Hard Limit: Intubation Date cannot be earlier than the Date of Birth.</p> <p>Intubation Date cannot be later than the extubation Date/Time.</p> <p>Intubation Date cannot be after the ECLS Stop Time.</p> <p>Intubation Date cannot be after the Date of Death.</p>	01/01/1989-present	ECLS.Runs	IntubationDate

Run Info (continued)					
Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/Modification	Table Name	Column Name / Stored Values
SARS-CoV-2 (COVID-19)	<p>This field collects information about suspicion, testing or confirmation of SARS-CoV-2- infection.</p> <p><u>COVID-19:</u></p> <p>COVID19 confirmed by testing: indicates the patient suspected and confirmed to be infected by COVID19 by laboratory testing.</p> <p>COVID19 suspected but NO testing: indicates patient is symptomatic of suspected COVID19 infection, but no confirmatory testing was performed.</p> <p>No clinical suspicion of COVID19 (and no testing): COVID19 not suspected due to patient clinical course.</p> <p>COVID19 confirmed negative: COVID19 infection was suspected but confirmed negative by laboratory testing.</p>		03/02/2020 -present	ECLS.Runs	<p>COVID19</p> <p>COVID19 confirmed by testing, value: 1 COVID19 suspected but NO testing, value:2 No clinical suspicion of COVID1 (and no testing), value:3 COVID19 confirmed negative, value: 4</p>
SARS-CoV-2 (MIS-C)	<p>This field collects information about suspicion, testing or confirmation of MIS-C presentation following SARS-CoV-2 infection.</p> <p><u>Multisystem Inflammatory Syndrome in Children (MIS-C):</u></p> <p>Clinically Suspected / Confirmed: MIS-C suspected or confirmed by clinical presentation and / or laboratory findings</p> <p>Not Clinically Suspected: indicates no clinical suspicion of MIS-C</p>	MIS-C Screening question is only applicable for patients < 21 years of age	06/15/2020 - present	ECLS.Runs	<p>MisC</p> <p>Lookup table: Clinically Suspected/Confirmed=1, Not Clinically Suspected=2</p>

3. PRE-ECLS ASSESSMENT

This section details the values for a patient closest to initiation AND before the initiation of ECLS. The data at maximum should be no more than 6 hours before the ECLS Start Time

Pre-ECLS Arterial Blood Gas

Choose the arterial blood gas that meets the following 3 criteria:

1. Drawn prior to the ECLS Start Time
2. Drawn no more than 6 hours before the ECLS Start Time
3. If multiple arterial blood gases exist in this time period, choose the pre-ECLS arterial blood gas closest to AND before the ECLS Start Time
4. If the patient is on cardiopulmonary bypass immediately preceding ECLS please use a blood gas prior to cardiopulmonary bypass

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/ Modification	Table Name	Column Name / Stored Values
Pre-ECLS Blood Gas Date/Time	<p>This field collects the date and time of the arterial blood gas that meets the timing criteria for the Pre-ECLS Arterial Blood Gas defined above.</p> <p>Patient M had an ECLS start time of 03/29/2017 02:00AM He had the following 4 blood gases following shorthand: pH/PaCO₂/PaO₂/HCO₃/SaO₂ Lactate=X, FiO₂ delivered=X</p> <p>ABG at 03/28/2017 7:00PM 7.13/48/42/18/76% Lactate 5 FiO₂ delivered = 100%</p> <p>ABG at 03/28/2017 10:00PM 7.06/58/35/16/61% Lactate 11 FiO₂ delivered = 100%</p> <p>ABG at 03/29/2017 1:00AM 7.07/55/40/16/71% Lactate 10 FiO₂ delivered = 100%</p> <p>ABG at 03/29/2017 at 02:05 AM 7.06/58/160/16/99% Lactate 12 FiO₂ delivered = 30%</p> <p>ABG on 03/28/2017 at 7:00PM is ineligible because it was collected more than 6 hours before the ECLS Start Time. ABG on 3/29/2017 at 2:05AM is ineligible because it is after ECLS Start Time. Enter Pre-ECLS Blood Gas Date/Time ABG at 03/29/2017 1:00AM because it is the ABG closest to the start of ECMO. Use all values for pH, PaCO₂, PaO₂, HCO₃, SaO₂, Lactate, from the same ABG and report the FiO₂ at the time the ABG was drawn.</p>	<p>Soft Notification: Pre- ECLS Blood Gas Date/Time must be BEFORE the ECLS Start Time but not more than 6 hrs before ECLS Start Time.</p> <p>Hard Limit: Pre- ECLS Blood Gas Date/Time must be BEFORE the time on ECMO.</p> <p>Pre- ECLS Blood Gas Date/Time cannot be earlier than the Date of Birth.</p> <p>Pre- ECLS Blood Gas Date/Time cannot be after the Date of Death.</p>	<p>01/01/1989-1/15/2017 Collect worst</p> <p>1/15/2017-present Closest to ECLS start AND pre-ECLS</p>	ECLS.BloodGases	Time

Pre-ECLS Arterial Blood Gas (continued)

Choose the arterial blood gas that meets the following 3 criteria:

1. Drawn prior to the ECLS Start Time
2. Drawn no more than 6 hours before the ECLS Start Time
3. If multiple arterial blood gases exist in this time period, choose the pre-ECMO arterial blood gas closest to AND before the ECLS Start Time

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/ Modification	Table Name	Column Name / Stored Values
pH	<p>This field collects the pH on that meets the timing criteria for the Pre-ECLS Arterial Blood Gas defined above.</p> <p>Potential of hydrogen (negative of the base 10 logarithm of the activity of the hydrogen ion) in the arterial blood sample. As this is part of the minimum dataset, if this information is unknown or unavailable check the appropriate box.</p>	<p>Precision 2 decimal points</p> <p>Soft Notification: < 6.90 or > 7.50</p> <p>Hard Limit: <6.00 or > 8.00</p> <p>This is part of the minimum dataset because it is incorporated into risk adjustment models.</p>	<p>01/01/1989-1/15/2017 Collect worst</p> <p>1/15/2017-present Closest to ECLS start AND pre-ECLS</p> <p>8/9/2018-present pH made mandatory data field, unknown checkbox added/unavailable</p>	ECLS.BloodGases	<p>pH</p> <p>0 = No</p> <p>1 = Yes</p>
PaCO ₂	<p>This field collects the arterial partial pressure of carbon dioxide (PaCO₂) that meets the timing criteria for the Pre-ECLS Arterial Blood Gas defined above.</p> <p>Arterial partial pressure of carbon dioxide in mm Hg</p>	<p>US units of Entry</p> <p>Precision whole number</p> <p>Soft Notification: < 30 mm Hg or > 100 mm Hg</p> <p>Hard Limit: < 10 mm Hg or > 250 mm Hg</p> <p>International Units</p> <p>Precision 2 decimal points</p> <p>Soft Notification: < 4.00 kPa or > 13.33 kPa</p> <p>Hard Limit: < 1.33 kPa or > 33.33 kPa</p>	<p>01/01/1989-1/15/2017 Collect worst</p> <p>1/15/2017-present Closest to ECLS start AND pre-ECLS</p>	ECLS.BloodGases	PCO2

Pre-ECLS Arterial Blood Gas (continued)

Choose the arterial blood gas that meets the following 3 criteria:

1. Drawn prior to the ECLS Start Time
2. Drawn no more than 6 hours before the ECLS Start Time
3. If multiple arterial blood gases exist in this time period, choose the pre-ECMO arterial blood gas closest to AND before the ECLS Start Time

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/ Modification	Table Name	Column Name / Stored Values
PaO ₂	<p>This field collects the arterial partial pressure oxygen (PaO₂) that meets the timing criteria for the Pre-ECLS Arterial Blood Gas defined above.</p> <p>Arterial partial pressure of oxygen in mm Hg</p>	<p>US units of Entry Precision whole number Soft Notification: < 20 mm Hg or > 300 mm Hg Hard Limit: < 0 mm Hg or > 760 mm Hg</p> <p>International Units Precision 2 decimal points Soft Notification: < 2.66 kPa or > 40.00 kPa Hard Limit: < 0 kPa or > 101.31 kPa</p>	<p>01/01/1989-1/15/2017 Collect worst</p> <p>1/15/2017-present Closest to ECLS start AND pre-ECLS</p>	ECLS.BloodGases	PO2
HCO ₃	<p>This field collects the arterial standard bicarbonate (HCO₃) that meets the timing criteria for the Pre-ECLS Arterial Blood Gas defined above. As this is part of the minimum dataset, if this information is unknown or unavailable check the appropriate box.</p> <p>Standard bicarbonate concentration mEq/L or mmol/L</p>	<p>US units of Entry Precision whole number Soft Notification: < 10 mEq/L or > 40 mEq/L Hard Limit: < 0 mEq/L or > 70 mEq/L</p> <p>International units Precision whole number Soft Notification: < 10 mmol/L or > 40 mmol/L Hard Limit: < 0 mmol/L or > 70 mmol/L</p> <p>This is part of the minimum dataset because it is incorporated into risk adjustment models.</p>	<p>01/01/1989-1/15/2018 Collect worst</p> <p>1/15/2017-present Closest to ECLS start AND pre-ECLS</p> <p>8/9/2018-present HCO3 made mandatory data field, unknown checkbox added/unavailable</p>	ECLS.BloodGases	HCO3 0 = No 1 = Yes

Pre-ECLS Arterial Blood Gas (continued)

Choose the arterial blood gas that meets the following 3 criteria:

1. Drawn prior to the ECLS Start Time
2. Drawn no more than 6 hours before the ECLS Start Time
3. If multiple arterial blood gases exist in this time period, choose the pre-ECMO arterial blood gas closest to AND before the ECLS Start Time

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/Modification	Table Name	Column Name / Stored Values
SaO ₂ (%)	<p>This field collects the arterial oxyhemoglobin saturation that meets the timing criteria for the Pre-ECLS Arterial Blood Gas defined above.</p> <p>Arterial blood oxyhemoglobin saturation from arterial blood gas in %.</p>	<p>Units of measure for US and International is % Precision whole number</p> <p>Soft Notification: <50% or > 100%</p> <p>Hard Limit: <1% or > 100%</p>	<p>01/01/1989-1/15/2018 Collect worst</p> <p>1/15/2018-present Closest to ECLS start AND pre-ECLS</p>	ECLS.BloodGases	SaO2
SpO ₂ (%)	<p>This field collects the peripheral oxyhemoglobin saturation that meets the timing criteria for the Pre-ECLS Arterial Blood Gas defined above.</p> <p>However, this is not a blood gas measurement, it is the noninvasive pulse oximeter measured oxyhemoglobin saturation.</p>	<p>Units of measure for US and International is % Precision whole number</p> <p>Soft Notification: <50% or > 100%</p> <p>Hard Limit: <1% or > 100%</p>	<p>1/15/2017-present Closest to ECLS start AND pre-ECLS</p>	ECLS.BloodGases	SpO2

Pre-ECLS Arterial Blood Gas (continued)

Choose the arterial blood gas that meets the following 3 criteria:

1. Drawn prior to the ECLS Start Time
2. Drawn no more than 6 hours before the ECLS Start Time
3. If multiple arterial blood gases exist in this time period, choose the pre-ECMO arterial blood gas closest to AND before the ECLS Start Time

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/ Modification	Table Name	Column Name / Stored Values
Lactate	<p>This field collects the highest serum lactate concentration from an arterial blood gas arterial oxyhemoglobin saturation that meets the timing criteria for the Pre-ECLS Arterial Blood Gas defined above. If the lactate was drawn from a venous sample it is ok to enter.</p> <p>Highest serum lactate concentration drawn in the 6 hours preceding ECLS. If not all blood gases collect lactate, it can be drawn separately from the other arterial blood gas values, but it still needs to fall in the above described time period for Pre-ECLS Arterial Blood Gas.</p>	<p>Units of measure for US and International is mmol/L</p> <p>Soft Notification: <0mmol/L or >20 mmol/l</p> <p>Hard Limit: <0mmol/L or >40 mmol/l</p>	<p>1/1/2017 Collect worst</p> <p>1/15/2018-present Closest to ECLS start AND pre-ECLS</p>	ECLS.BloodGases	Lactate
FiO2	<p>This field collects the percentage of inspired oxygen at the time the Pre-ECLS Arterial Blood Gas was drawn.</p> <p>Percentage of inspired oxygen at the time the blood gas was obtained</p>	<p>Units of measure for US and International is %</p> <p>Precision whole number</p> <p>Soft Notification: <21% or > 100%</p> <p>Hard Limit: <10% or > 100%</p>	<p>01/01/1989- 1/15/2018 Collect worst</p> <p>1/15/2018-present Closest to ECLS start AND pre-ECLS</p>	ECLS.VentSettings	FiO2

Pre-ECLS Ventilator Settings

Choose the Ventilator Settings that meet the following 3 criteria:

1. Ventilator settings used prior to ECLS Start Time
2. Exclude ventilator settings used more than 6 hours before the ECLS Start Time
3. If multiple ventilator settings exist, report the last reported ventilator settings before the ECLS Start Time. If the patient was receiving hand delivered bag valve ventilation immediately prior to going on ECMO please use the ventilator settings just prior to hand delivered bag valve ventilation unless the patient was hand delivered bag valve ventilation for the entire time prior to the ECLS Start Time.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/ Modification	Table Name	Column Name / Stored Values
Pre-ECLS Vent Settings Date/Time	<p>This field collects the date and time of the ventilator settings that meet the timing criteria for Pre-ECLS Ventilator Settings defined above criteria.</p> <p>Patient M had an ECLS start time of 03/29/2017 02:00AM He had the following 4 reports of ventilation support. All pressure measurements are reported in cm of water.</p> <p>Settings at 03/28/2017 7:00PM Conventional Mechanical Ventilator (CMV) in Pressure Control (PC) with Assist Control (AC) with settings: set ventilator rate 30, PIP 35, PEEP 20, FiO₂ 100% and measured Mean Airway Pressure (MAP) 28.</p> <p>Settings at 03/28/2017 10:00PM High Frequency Oscillatory Ventilation (HFOV) with settings: MAP 40, Hertz (Hz) 8, Amplitude 75, FiO₂ 100%</p> <p>Settings at 03/29/2017 1:00AM Hand Delivered Bag Valve Ventilation Rate 25-35, PIP 40-50, PEEP 25, FiO₂ 100%</p> <p>Settings at 03/29/2017 at 02:05 AM CMV PC/AC with settings: rate 10, PIP 25, PEEP 10, FiO₂ 30%</p> <p>Pre-ECLS Vent Settings at 03/28/2017 7:00PM and 03/29/2017 at 02:05 AM are ineligible because they are more than 6 hours before ECLS Start Time and after ECLS Start Time, respectively. Do not enter the and Delivered Bag Valve Mask Settings. Instead choose HFOV with settings: MAP 40, Hertz (Hz) 8, Amplitude 75, Enter Pre-ECLS Vent Settings Date/Time 03/28/2017 10:00PM.</p>	<p>Soft Notification: Pre- ECLS Vent Settings Date/Time must be BEFORE the ECLS Start Time but not more than 6 hrs before ECLS Start Time.</p> <p>Hard Limit: Pre- ECLS Vent Settings Date/Time must be BEFORE the time on ECMO.</p> <p>Pre- ECLS Vent Settings Date/Time cannot be earlier than the Date of Birth.</p> <p>Pre- ECLS Vent Settings Date/Time cannot be after the Date of Death.</p>	<p>01/01/1989-1/15/2018 Collect worst</p> <p>1/15/2018-present Closest to ECLS start AND pre-ECLS</p>	ECLS.VentSettings	Time

Pre-ECLS Ventilator Settings (continued)

Choose the Ventilator Settings that meet the following 3 criteria:

1. Ventilator settings used prior to ECLS Start Time
2. Exclude ventilator settings used more than 6 hours before the ECLS Start Time
3. If multiple ventilator settings exist, report the last reported ventilator settings before the ECLS Start Time. If the patient was receiving hand delivered bag valve ventilation immediately prior to going on ECMO, please use the ventilator settings just prior to hand delivered bag valve ventilation unless the patient was hand delivered bag valve ventilation for the entire time prior to the ECLS Start Time.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/ Modification	Table Name	Column Name / Stored Values
Ventilator Type	<p>This field collects the type of mechanical ventilation at the timing that meets the criteria for Pre-ECLS Ventilator Settings defined above.</p> <p>Select one from the drop down Other if type known but unspecified Conventional = Conventional mechanical ventilation includes pressure control, pressure regulated volume control, volume control, and inverse ratio ventilation such as airway pressure release ventilation. HFO = High frequency oscillatory ventilation Other HFV = other high frequency ventilator = High frequency jet ventilation, percussive ventilation No Ventilator = No ventilator was in use Unknown if type unknown</p>	<p>This is part of the minimum dataset because it is incorporated into risk adjustment models.</p>	<p>01/01/1989-1/15/2018 Collect worst</p> <p>1/15/2018-present Closest to ECLS start AND pre-ECLS</p> <p>8/1/2018 Collect None</p> <p>8/9/2018-present Ventilator Type made mandatory data field</p>	ECLS.VentSettings	<p>VentTypeId</p> <p>As defined on X-Walk Table</p> <p>VentTypes</p> <p>0 = Other 1 = Conventional 2 = HFO 3 = Other HFV 4 = No Ventilator 5 = Unknown</p>
Conventional Rate	<p>This field collects the set respiratory rate in breaths per minute for conventional ventilation that meets timing criteria for Pre-ECLS Ventilator Settings defined above.</p> <p>You can only record a conventional rate if you choose the type of ventilator to be conventional, other HFV or other.</p>	<p>Units of measure is breaths per minute (bpm) Precision whole number Soft Notification: < 10 bpm or > 40 bpm Hard Limit: < 0 bpm or > 125 bpm</p>	<p>01/01/1989-1/15/2018 Collect worst Only collected one rate field. Separated.</p> <p>1/15/2018-present Closest to ECLS start AND pre-ECLS. Separated conventional and HFV rate.</p>	ECLS.VentSettings	Rate

Pre-ECLS Ventilator Settings (continued)

Choose the Ventilator Settings that meet the following 3 criteria:

1. Ventilator settings used prior to ECLS Start Time
2. Exclude ventilator settings used more than 6 hours before the ECLS Start Time
3. If multiple ventilator settings exist, report the last reported ventilator settings before the ECLS Start Time. If the patient was receiving hand delivered bag valve ventilation immediately prior to going on ECMO, please use the ventilator settings just prior to hand delivered bag valve ventilation unless the patient was hand delivered bag valve ventilation for the entire time prior to the ECLS Start Time.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/ Modification	Table Name	Column Name / Stored Values
HFV Rate	<p>This field collects the set high frequency ventilation rate in Hertz (Hz) = breaths per second. that meets the Pre-ECLS Ventilator Settings above.</p> <p>You can only record a HFV rate if you choose HFV, other HFV or other.</p>	<p>Units of measure is Hertz (Hz) Precision one decimal point</p> <p>Soft Notification: <3 Hz or > 17 Hz Hard Limit: <3 Hz or > 17 Hz</p>	<p>01/01/1989-1/15/2018 Collect worst. Only collected one rate field. Separated.</p> <p>1/15/2018-present Closest to ECLS start AND pre-ECLS. Separated conventional and HFV rate.</p>	ECLS.VentSettings	HighFrequencyRate
MAP	<p>This field collects the Mean Airway Pressure (MAP) in centimeters of water at the timing that meets the criteria for Pre-ECLS Ventilator Settings defined above.</p> <p>The MAP is a measured variable in conventional mechanical ventilation and set variable in HFOV.</p>	<p>Units of measure is cm H₂O Precision whole number</p> <p>Soft Notification: < 10 cm H₂O or > 30 cm H₂O Hard Limit: < 0 cm H₂O or > 60 cm H₂O</p>	<p>01/01/1989-1/15/2018 Collect worst</p> <p>1/15/2018-present Closest to ECLS start AND pre-ECLS</p>	ECLS.VentSettings	MAP

Pre-ECLS Ventilator Settings (continued)

Choose the Ventilator Settings that meet the following 3 criteria:

4. Ventilator settings used prior to ECLS Start Time
5. Exclude ventilator settings used more than 6 hours before the ECLS Start Time
6. If multiple ventilator settings exist, report the last reported ventilator settings before the ECLS Start Time. If the patient was receiving hand delivered bag valve ventilation immediately prior to going on ECMO, please use the ventilator settings just prior to hand delivered bag valve ventilation unless the patient was hand delivered bag valve ventilation for the entire time prior to the ECLS Start Time.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/ Modification	Table Name	Column Name / Stored Values
PIP	<p>This field collects the Peak Inspiratory Pressure (PIP), that meets the timing criteria for Pre-ECLS Ventilator Settings defined above.</p> <p>Peak Inspiratory Pressure (PIP) for conventional pressure control, pressure regulated volume control, volume control and the Phigh in inverse ratio ventilation such as airway pressure release ventilation.</p>	<p>PIP is displayed for conventional, other HFV, and other</p> <p>Units of measure is cm H₂O Precision whole number</p> <p>Soft Notification: < 10 cm H₂O or > 45 cm H₂O</p> <p>Hard Limit: PIP must be greater than or equal to MAP PIP must be greater than or equal to PEEP</p> <p>< 0 cm H₂O or > 80 cm H₂O</p>	<p>01/01/1989-1/15/2018 Collect worst value. Amplitude and PIP in same data entry field.</p> <p>1/15/2018-present Closest to ECLS start AND pre-ECLS. Separated data fields for PIP and Amplitude.</p>	ECLS.VentSettings	PIP

Pre-ECLS Ventilator Settings (continued)

Choose the Ventilator Settings that meet the following 3 criteria:

1. Ventilator settings used prior to ECLS Start Time
2. Exclude ventilator settings used more than 6 hours before the ECLS Start Time
3. If multiple ventilator settings exist, report the last reported ventilator settings before the ECLS Start Time. If the patient was receiving hand delivered bag valve ventilation immediately prior to going on ECMO, please use the ventilator settings just prior to hand delivered bag valve ventilation unless the patient was hand delivered bag valve ventilation for the entire time prior to the ECLS Start Time.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/Modification	Table Name	Column Name / Stored Values
Amplitude	<p>This field collects the Amplitude or Delta Pressure (DP), that meets the timing criteria for Pre-ECLS Ventilator Settings defined above.</p> <p>High Frequency Amplitude for high frequency oscillatory ventilation or other high frequency ventilation or other.</p>	<p>Amplitude is displayed for HFO, other HFV, and other</p> <p>Units of measure is cm H₂O Precision whole number</p> <p>Soft Notification: < 30 cm H₂O or > 90 cm H₂O</p> <p>Hard Limit: < 10 cm H₂O or > 100 cm H₂O</p>	<p>01/01/1989-1/15/2018 Collect worst value. Amplitude and PIP in same data entry field</p> <p>1/15/2018-present Closest to ECLS start AND pre-ECLS. Separated data fields for PIP and Amplitude.</p>	ECLS.VentSettings	DeltaP
PEEP	<p>This field collects the positive end-expiratory pressure (PEEP) that meets the timing criteria for Pre-ECLS Ventilator Settings defined above.</p> <p>PEEP can only be collected when a patient is in conventional, other high frequency ventilation or other.</p>	<p>PEEP is displayed for conventional, other HFV, and other</p> <p>Units of measure is cm H₂O Precision whole number</p> <p>Soft Notification: < 5 cm H₂O or > 25 cm H₂O</p> <p>Hard Limit: < 0 cm H₂O or > 40 cm H₂O</p>	<p>01/01/1989-1/15/2018 Collect worst</p> <p>1/15/2018-present Closest to ECLS start AND pre-ECLS</p>	ECLS.VentSettings	PEEP

Pre-ECLS Ventilator Settings (continued)

Choose the Ventilator Settings that meet the following 3 criteria:

1. Ventilator settings used prior to ECLS Start Time
2. Exclude ventilator settings used more than 6 hours before the ECLS Start Time
3. If multiple ventilator settings exist, report the last reported ventilator settings before the ECLS Start Time. If the patient was receiving hand delivered bag valve ventilation immediately prior to going on ECMO, please use the ventilator settings just prior to hand delivered bag valve ventilation unless the patient was hand delivered bag valve ventilation for the entire time prior to the ECLS Start Time.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/Modification	Table Name	Column Name / Stored Values
Hand Bag Valve Ventilation	<p>This field collects if the patient could no longer be supported with mechanical ventilation and needed to convert to hand bag valve ventilation. Only select this if the patient received hand bag valve ventilation through an invasive airway beginning in the 6 hours prior to the ECLS Start Time AND continuing until the time the patient went on ECLS.</p> <p>Select yes, no or unknown from the drop down menu</p> <p>Patient Y went on ECLS on 10/1/2017 at 8:00PM. At 3:00 PM on 10/1/2017 he was transitioned to hand bag ventilation because his CO2 climbed to 100 mm Hg. His mechanical ventilator settings were adjusted and he was placed back on the mechanical ventilator at 3:15 PM. Select No.</p> <p>Patient Z went on ECLS at 10/2/2017 at 2:00PM. At 1:00 PM she could no longer maintain oxygen saturations above 70% on 100% FiO₂. She was disconnected from mechanical ventilation and received hand bag valve ventilation until she was on ECLS support. Select Yes.</p>		<p>01/01/1989-1/15/2018 Collect worst</p> <p>1/15/2018-present Closest to ECLS start AND pre-ECLS</p>	ECLS.VentSettings	<p>HandBagging</p> <p>0 = No 1 = Yes -1 = Unknown</p>

Pre-ECLS Hemodynamics

This section details hemodynamic values for a patient closest to initiation AND before the ECLS Start Time. The data, at maximum, should be from no more than 6 hours before the ECLS Start Time.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/Modification	Table Name	Column Name / Stored Values
Pre-ECLS Hemodynamics Date/Time	<p>This field collects the date and time that the Systolic Blood Pressure (SBP), Diastolic Blood Pressure (DBP) and Mean Blood Pressure (Mean BP) were simultaneously collected in accordance with Pre-ECLS Hemodynamics timing criteria defined above.</p> <p>The Pre-ECLS Hemodynamics Date/Time should refer to the date and time of the Systolic Blood Pressure (SBP), Diastolic Blood Pressure (DBP) and Mean Blood Pressure (Mean BP) which all should be measured at the same time. If a patient has an invasive arterial line that is measuring blood pressure please report values from the arterial line. If the patient does not have invasive arterial blood pressure monitoring in the 6 hours prior to the ECLS Start Time, then use noninvasive blood pressure monitoring values that fall in that time frame.</p> <p>Patient M had an ECLS start time of 03/29/2017 02:00AM He had the following 4 reports of blood pressure. Reported as SBP/DBP (Mean BP) in mm Hg At 03/28/2017 7:00PM Arterial BP 60/40 (53) At 03/28/2017 10:00PM Arterial BP 70/40 (58) At 03/29/2017 1:00AM Noninvasive BP 62/42 (55) At 03/29/2017 at 02:05 AM Arterial BP 80/50 (65)</p> <p>Enter Pre-ECLS Hemodynamics Date/Time 03/29/2017 1:00AM and enter the Arterial BP with Systolic 70 mm Hg, Diastolic BP 40 mm Hg and Mean BP 58 mm Hg</p>	<p>Soft Notification: Pre- ECLS Hemodynamics Date/Time must be BEFORE the ECLS Start Time but not more than 6 hrs before ECLS Start Time.</p> <p>Hard Limit: Pre- ECLS Hemodynamics Date/Time must be BEFORE the time on ECMO.</p> <p>Pre- ECLS Hemodynamics Date/Time cannot be earlier than the Date of Birth.</p> <p>Pre- ECLS Hemodynamics Date/Time cannot be after the Date of Death.</p>	<p>01/01/1998-12/1/2011 data recommended for collection on neonates only though it was collected on non-neonatal patients</p> <p>12/1/2011-1/15/2018 data recommended for all age groups and recommended to be collected as worst value.</p> <p>1/15/2018-present Closest to ECLS start AND pre-ECLS</p>	ECLS.Hemodynamics	Time

Pre-ECLS Hemodynamics (continued)

This section details hemodynamic values for a patient closest to initiation AND before the ECLS Start Time. The data, at maximum, should be from no more than 6 hours before the ECLS Start Time.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/Modification	Table Name	Column Name / Stored Values
Systolic BP	<p>This field collects the systolic blood pressure (SBP) that meets the Pre-ECLS Hemodynamics timing criteria defined above.</p> <p>Enter the systolic of a single measurement of blood pressure. If an arterial blood pressure and non-invasive cuff pressure exist, please choose the arterial pressure monitor reading.</p> <p>As this is part of the minimum dataset, if this information is unknown or unavailable check the appropriate box.</p>	<p>Units of measure are mm Hg Precision: whole number</p> <p>Neonate (0-28 days) Soft Notification: < 30 mm Hg or > 90 mm Hg Hard Limit: < 0 mm Hg or > 150 mm Hg</p> <p>Pediatric (29 days – 17 yrs) Soft Notification: < 50 mm Hg or > 180 mm Hg Hard Limit: < 0 mm Hg or > 250 mm Hg</p> <p>Adult (≥ 18 yrs) Soft Notification: < 50 mm Hg or > 180 mm Hg Hard Limit: < 0 mm Hg or > 300 mm Hg</p> <p>This is part of the minimum dataset because it is incorporated into risk adjustment models.</p>	<p>01/01/1998-12/1/2011 data recommended for collection on neonates only though it was collected on non-neonatal patients</p> <p>12/1/2011-1/15/2018 data recommended for all age groups and recommended to be collected as worst value.</p> <p>1/15/2018-present Closest to ECLS start AND pre-ECLS</p> <p>8/9/2018-present SBP made mandatory data field, Unavailable/unknown checkbox added</p>	ECLS.Hemodynamics	SBP

Pre-ECLS Hemodynamics (continued)

This section details hemodynamic values for a patient closest to initiation AND before the ECLS Start Time. The data, at maximum, should be from no more than 6 hours before the ECLS Start Time.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/ Modification	Table Name	Column Name / Stored Values
Diastolic BP	<p>This field collects the diastolic blood pressure (DBP) that meets the Pre-ECLS Hemodynamics timing criteria defined above.</p> <p>Enter the diastolic of a single measurement of blood pressure. If an arterial blood pressure and non-invasive cuff pressure exist, please choose the arterial pressure monitor reading.</p> <p>As this is part of the minimum dataset, if this information is unknown or unavailable check the appropriate box.</p>	<p>Units of measure are mm Hg Precision: whole number</p> <p>Neonate (0-28 days) Soft Notification: < 15 mm Hg or > 80 mm Hg Hard Limit: < 0 mm Hg or > 150 mm Hg</p> <p>Pediatric (29 days – 17 yrs) Soft Notification: < 20 mm Hg or > 150 mm Hg Hard Limit: < 0 mm Hg or > 200 mm Hg</p> <p>Adult (≥ 18 yrs) Soft Notification: < 30 mm Hg or > 180 mm Hg Hard Limit: < 0 mm Hg or > 250 mm Hg</p> <p>Hard Limit: The Diastolic BP cannot be greater than the Systolic BP.</p> <p>This is part of the minimum dataset because it is incorporated into risk adjustment models.</p>	<p>01/01/1998-12/1/2011 data recommended for collection on neonates only though it was collected on non-neonatal patients</p> <p>12/1/2011-1/15/2018 data recommended for all age groups and recommended to be collected as worst value.</p> <p>1/15/2018-present Closest to ECLS start AND pre-ECLS</p> <p>8/9/2018-present Diastolic BP made mandatory data field, Unavailable/unknown checkbox added</p>	ECLS.Hemodynamics	DBP

Pre-ECLS Hemodynamics (continued)

This section details hemodynamic values for a patient closest to initiation AND before the ECLS Start Time. The data, at maximum, should be from no more than 6 hours before the ECLS Start Time.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/Modification	Table Name	Column Name / Stored Values
Mean BP	<p>This field collects the mean blood pressure (Mean BP) that meets the Pre-ECLS Hemodynamics timing criteria defined above.</p> <p>Enter the mean of a single measurement of blood pressure. If an arterial blood pressure and non-invasive cuff pressure exist please choose the arterial pressure monitor reading.</p>	<p>Units of measure are mm Hg Precision: whole number</p> <p>Neonate (0-28 days) Soft Notification: < 20 mm Hg or > 70 mm Hg Hard Limit: < 0 mm Hg or > 150 mm Hg</p> <p>Pediatric (29 days – 17 yrs) Soft Notification: < 30 mm Hg or > 150 mm Hg Hard Limit: < 0 mm Hg or > 200 mm Hg</p> <p>Adult (≥ 18 yrs) Soft Notification: < 30 mm Hg or > 180 mm Hg Hard Limit: < 0 mm Hg or > 250 mm Hg</p> <p>Hard Limit: The Mean BP must be greater than or equal to the Diastolic BP The Mean BP must be less than or equal to the Systolic BP</p>	<p>01/01/1998- 12/1/2011 data recommended for collection on neonates only though it was collected on non-neonatal patients</p> <p>12/1/2011-1/15/2018 data recommended for all age groups and recommended to be collected as worst value.</p> <p>1/15/2018-present Closest to ECLS start AND pre-ECLS</p>	ECLS.Hemodynamics	MAP

Pre-ECLS Hemodynamics (continued)

This section details hemodynamic values for a patient closest to initiation AND before the ECLS Start Time. The data, at maximum, should be from no more than 6 hours before the ECLS Start Time.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/Modification	Table Name	Column Name / Stored Values
SvO2	<p>This field collects the mixed venous oxygen saturation (SvO₂) of the patient's blood that meets the Pre-ECLS Hemodynamics timing criteria defined above.</p> <p>Enter the lowest SvO₂ measured, ideally from the pulmonary artery or secondarily right atrium, but it is acceptable to enter SvO₂ from any central line.</p>	<p>Units of measure % of hemoglobin oxygen saturation Precision: whole number</p> <p>Soft Notification: < 20% or > 80 %</p> <p>Hard Limit: < 0 % or > 100 %</p>	<p>01/01/1998- 12/1/2011 data recommended for collection on neonates only though it was collected on non-neonatal patients</p> <p>12/1/2011-1/15/2018 data recommended for all age groups and recommended to be collected as worst value.</p> <p>1/15/2018-present Closest to ECLS start AND pre-ECLS</p>	ECLS.Hemodynamics	SvO2

Pre-ECLS Hemodynamics (continued)

This section details hemodynamic values for a patient closest to initiation AND before the ECLS Start Time. The data, at maximum, should be from no more than 6 hours before the ECLS Start Time.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/ Modification	Table Name	Column Name / Stored Values
PCWP	<p>This field collects the Pulmonary Capillary Wedge Pressure (PCWP) that meets the Pre-ECLS Hemodynamics timing criteria defined above.</p> <p>Enter the highest PCWP measured with an indwelling pulmonary artery catheter.</p>	<p>Units of measure mm Hg Precision: whole number</p> <p>Neonate (0-28 days) Soft Notification: < 0 mm Hg or > 30 mm Hg Hard Limit: < 0 mm Hg or > 100 mm Hg</p> <p>Pediatric and Adult (> 29 days) Soft Notification: < 0 mm Hg or > 45 mm Hg Hard Limit: < 0 mm Hg or > 100 mm Hg</p>	<p>01/01/1998- 12/1/2011 data recommended for collection on neonates only though it was collected on non-neonatal patients</p> <p>12/1/2011-1/15/2018 data recommended for all age groups and recommended to be collected as worst value.</p> <p>1/15/2018-present Closest to ECLS start AND pre-ECLS</p>	ECLS.Hemodynamics	PCWP
Systolic PAP	<p>This field collects the Systolic Pulmonary Arterial Pressure (Systolic PAP) that meets the Pre-ECLS Hemodynamics timing criteria defined above.</p> <p>Enter the highest systolic PAP measured with an indwelling pulmonary artery catheter</p>	<p>Units of measure mm Hg Precision whole number</p> <p>Neonate (0-28 days) Soft Notification: < 5 mm Hg or > 50 mm Hg Hard Limit: < 0 mm Hg or > 100 mm Hg</p> <p>Pediatric and Adult (> 29 days) Soft Notification: < 5 mm Hg or > 90 mm Hg Hard Limit: < 0 mm Hg or > 150 mm Hg</p>	<p>001/01/1998- 12/1/2011 data recommended for collection on neonates only though it was collected on non-neonatal patients</p> <p>12/1/2011-1/15/2018 data recommended for all age groups and recommended to be collected as worst value.</p> <p>1/15/2018-present Closest to ECLS start AND pre-ECLS 1/01/1989-present</p>	ECLS.Hemodynamics	SPAP

Pre-ECLS Hemodynamics (continued)

This section details hemodynamic values for a patient closest to initiation AND before the ECLS Start Time. The data, at maximum, should be from no more than 6 hours before the ECLS Start Time.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/ Modification	Table Name	Column Name / Stored Values
Diastolic PAP	<p>This field collects the Diastolic Pulmonary Arterial Pressure (Diastolic PAP) that meets the Pre-ECLS Hemodynamics timing criteria defined above.</p> <p>Enter the highest diastolic PAP measured with an indwelling pulmonary artery catheter.</p>	<p>Units of measure mm Hg Precision: whole number</p> <p>Neonate (0-28 days) Soft Notification: < 1 mm Hg or > 40 mm Hg Hard Limit: < 0 mm Hg or > 80 mm Hg</p> <p>Pediatric and Adult (> 29 days) Soft Notification: < 2 mm Hg or > 80 mm Hg Hard Limit: < 0 mm Hg or > 130 mm Hg</p> <p>Hard Limit: Diastolic PAP cannot be greater than Systolic PAP.</p>	<p>01/01/1998- 12/1/2011 data recommended for collection on neonates only though it was collected on non-neonatal patients</p> <p>12/1/2011-1/15/2018 data recommended for all age groups and recommended to be collected as worst value.</p> <p>1/15/2018-present Closest to ECLS start AND pre-ECLS</p>	ECLS.Hemodynamics	DPAP

Pre-ECLS Hemodynamics (continued)

This section details hemodynamic values for a patient closest to initiation AND before the ECLS Start Time. The data, at maximum, should be from no more than 6 hours before the ECLS Start Time.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/ Modification	Table Name	Column Name / Stored Values
Mean PAP	<p>This field collects the Mean Pulmonary Arterial Pressure (Mean PAP) that meets the Pre-ECLS Hemodynamics timing criteria defined above.</p> <p>Enter the highest Mean PAP measured with an indwelling pulmonary artery catheter.</p>	<p>Units of measure mm Hg Precision: whole number</p> <p>Neonate (0-28 days) Soft Notification: < 2 mm Hg or > 45 mm Hg Hard Limit: < 0 mm Hg or > 85 mm Hg</p> <p>Pediatric and Adult (> 29 days) Soft Notification: < 2 mm Hg or > 80 mm Hg Hard Limit: < 0 mm Hg or > 140 mm Hg</p> <p>Hard Limit: The Mean PAP must be greater than or equal to the Diastolic PAP The Mean PAP must be less than or equal to the Systolic PAP</p>	<p>01/01/1998- 12/1/2011 data recommended for collection on neonates only though it was collected on non-neonatal patients</p> <p>12/1/2011-1/15/2018 data recommended for all age groups and recommended to be collected as worst value.</p> <p>1/15/2018-present Closest to ECLS start AND pre-ECLS</p>	ECLS.Hemodynamics	MPAP
Cardiac Index	<p>This field collects the cardiac index that meets the Pre-ECLS Hemodynamics timing criteria defined above.</p> <p>Enter the lowest Cardiac Index calculated: Cardiac Output / Body Surface Area = L/min/m² or measured.</p>	<p>Units of measure L/min/m² Precision: one decimal point</p> <p>Soft Notification: < 1 L/min/m² or > 10 L/min/m² Hard Limit: < 0 L/min/m² or > 20 L/min/m²</p>	<p>01/01/1998- 12/1/2011 data recommended for collection on neonates only though it was collected on non-neonatal patients</p> <p>12/1/2011-1/15/2018 data recommended for all age groups and recommended to be collected as worst value.</p> <p>1/15/2018-present Closest to ECLS start AND pre-ECLS</p>	ECLS.Hemodynamics	CI

4. PRE-ECLS SUPPORT

This section details the support a patient may require prior to initiating ECLS. Pre-ECLS Support Codes are defined by ELSO as being used at least once to support a patient prior to initiating ECLS. Generally, these support mechanisms are limited to 24 hours prior to ECLS

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/ Modification	Table Name	Column Name / Stored Values
Hospital Admit Date/Time	<p>This field collects the date and time a patient was admitted to the ECLS center entering data.</p> <p>Enter the date and time (DD/MM/YYYY HH:MM) the patient was admitted to your ECLS Center.</p> <p>The admission date/time may be the same as the time of admission for a transfer on ECLS.</p> <p>Patient T was admitted to Hospital on A on 02/12/2017. She was placed on ECLS at Hospital A on 02/14/2017 at 11:57 PM. Subsequently, she transferred to your Hospital B on 02/15/2017 at 02:00 AM for continued ECLS care. Hospital B will enter Hospital Admit Date 02/15/2017.</p>	<p>Hard Limit:</p> <p>Hospital Admit Date cannot be earlier than the Date of Birth.</p> <p>Hospital Admit Date cannot be after the Date of Death.</p> <p>Hospital Admit Date cannot be after ECLS Stop Time.</p> <p>If Patient Transported to your center = “transported not on ECMO” or “not transported” or “unknown”; then Hospital Admit Date must be BEFORE ECLS start time</p> <p>This is part of the minimum dataset because it is incorporated into risk adjustment models.</p>	01/01/1989-present	ECLS.Runs	AdmitDate

Pre-ECLS Support (continued)

This section details the support a patient may require prior to initiating ECLS. Pre-ECLS Support Codes are defined by ELSO as being used at least once to support a patient prior to initiating ECLS. Generally, these support mechanisms are limited to 24 hours prior to ECLS

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/ Modification	Table Name	Column Name / Stored Values
Patient Transported to your center	<p>This field collects if a patient was transported on ECLS</p> <p>Select transported on ECMO, transported not on ECMO, not transported or unknown to indicate how the patient was admitted to your center, whether or not on ECLS, from another ECLS institution.</p> <p>If transported on ECMO is selected, choose whether the transport was received from an ELSO Center or Non-ELSO Center.</p> <p>Transported from an ELSO Center will require the entry of the Center ID/Name of Center. These names will autopopulate.</p> <p>Transported from a non ELSO Center will require the entry of the Name of Center.</p> <p>Patient T was admitted to Hospital on A on 02/12/2017. She was placed on ECLS at Hospital A on 02/14/2017 at 11:57 PM. Subsequently, she transferred to your Hospital B on 02/15/2017 at 02:00 AM for continued ECLS care. Hospital B will select dropdown for Transported on ECMO.</p> <p>Patient S was admitted to Hospital A on 2/12/2017. She was transferred to Hospital B on 2/15/2017 and went on ECLS at 20:15 on 2/16/2017. Hospital B will select Transported not on ECMO</p>	<p>Selection of Transported on ECMO will drop down choice of ELSO Center or Non ELSO Center.</p> <p>Once type of center selected, enter name of center. ELSO Centers will autopopulate.</p>	<p>10/01/2016</p> <p>12/01/2013 - 01/21/2017 “pt transported”</p> <p>01/21/2017 - present “pt transported on ECMO” as an option</p> <p>04/03/2022– present Transported on ECMO allows choice from an ELSO Center or NonELSO Center with center name entry.</p>	ECLS.Runs	<p>PatientTransportedNew</p> <p>0 = Transported not on ECMO 1 = Transported on ECMO 2 = Not transported -1 = Unknown</p> <p>TransferType 1 = Transferring run to ELSO center 2 = Transferring run to non-ELSO center 3 = Received run from ELSO center 4 = Received run from non-ELSO center 5 = matched / confirmed received run</p> <p>TransferELSOCenter Valid center number</p> <p>TransferNonELSOCenter Free text</p>

Pre-ECLS Support (continued)

This section details the support a patient may require prior to initiating ECLS. Pre-ECLS Support Codes are defined by ELSO as being used at least once to support a patient prior to initiating ECLS. Generally, these support mechanisms are limited to 24 hours prior to ECLS

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/ Modification	Table Name	Column Name / Stored Values
Pre-ECLS Cardiac Arrest	<p>This field collects if a patient experienced a cardiac arrest prior to ECLS support.</p> <p>Select yes, no or unknown to indicate if the patient experienced a cardiac arrest within 24 hours prior to ECLS. Cardiac arrest is defined as any event(s) that require the use of cardiopulmonary resuscitation (CPR) with the administration of external cardiac massage.</p> <p>Patient C had a cardiac arrest on July 7th 2017 at 12:00PM. He went on ECLS on July 9th 2017 at 1:00PM. He had no further cardiac arrest in between. Select no from dropdown for Pre-ECLS Cardiac Arrest.</p>	<p>This is part of the minimum dataset because it is incorporated into risk adjustment models.</p>	<p>01/01/1989-present</p> <p>8/9/2018-present</p> <p>Pre-ECLS Cardiac Arrest made mandatory data field.</p>	ECLS.Runs	<p>PreECLSArrest</p> <p>0 = No</p> <p>1 = Yes</p> <p>-1 = Unknown</p>

Pre-ECLS Support (continued)

This section details the support a patient may require prior to initiating ECLS. Pre-ECLS Support Codes are defined by ELSO as being used at least once to support a patient prior to initiating ECLS. Generally, these support mechanisms are limited to 24 hours prior to ECLS.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/Modification	Table Name	Column Name / Stored Values
Bridge to Transplant	<p>This field collects if a patient received ECLS as a pre-ECLS decision to bridge the patient to transplant.</p> <p>Yes indicates the patient was placed on ECLS as a method of ‘bridging’ the patient to transplant.</p> <p>No indicates a patient was placed on ECLS without consideration of need for transplant and later received a transplant select.</p> <p>Unknown</p> <p>Patient X was placed on ECLS for myocarditis with hope for recovery but a recognition that he could need a transplant if his heart function failed to recover. His heart function did not recover and he received a heart transplant from ECLS. Bridge to Transplant select No from the drop down.</p> <p>Patient Y went on ECLS with cystic fibrosis and expected bridge to lung transplant but during the course of his run he died before he could receive a lung transplant. Bridge to Transplant select Yes from the drop down.</p>		10/01/2016-present	ECLS.Runs	<p>Transplant</p> <p>0 = No 1 = Yes -1 = Unknown</p>
Is Trauma the underlying reason the person went on ECLS?	<p>Use this field to indicate if the need for ECLS is due to a traumatic injury.</p> <p>Select yes, no or unknown.</p> <p>Patient C was in a car accident on 10/01/2017. He suffered bilateral pulmonary contusions and developed severe post-traumatic acute respiratory distress syndrome and was paced on ECLS 1 day after admission. Select Yes from the dropdown for Is Trauma the reason the person went on ECLS?</p> <p>Patient Z was in a car accident on 09/11/2017. She suffered bilateral pulmonary contusions and developed severe post-traumatic acute respiratory distress syndrome. She recovered with conventional mechanical ventilator support and was extubated on 09/20/2017 and transferred to the floor. While recovering, three days later she had an aspiration pneumonia with brief cardiac arrest and return of spontaneous circulation. She again developed ARDS and this time required ECLS. Is Trauma the underlying reason the person went on ECLS? Select No from the dropdown.</p>		12/01/2017-present	ECLS.Runs	<p>Trauma</p> <p>0 = No 1 = Yes -1 = Unknown</p>

Mechanical Cardiac Support Codes

Select each support type that was employed prior to the ECLS Start Time. These generally refer to supports received within the 24 hours leading up to ECLS, though many of these supports may have been initiated days, or even months, prior to ECLS.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/Modification	Table Name	Column Name / Stored Values
Mechanical Cardiac Support Codes	This field collects if any mechanical cardiac support was used prior to ECLS	Yes or No response mandatory for category	08/21/2018 – Present		
Cardiac pacemaker	<p>This field collects if a patient had a permanent pacemaker placed prior to ECLS.</p> <p>Check permanent pacemaker if patient had a permanent pacemaker prior to ECLS</p> <p>Patient Y had congenital heart surgery and received temporary pacing wires. Subsequently he went on ECLS and before hospital discharge received a permanent pacemaker. Do not check cardiac pacemaker.</p>		01/15/2018-present	ECLS.Support	SupportCodeId 104
Cardiopulmonary bypass	<p>This field collects if the patient received cardiopulmonary bypass (CPB) in the 24 hours prior to going on ECLS.</p> <p>Check cardiopulmonary bypass if the patient received CPB within the 24 prior to ECLS.</p> <p>Patient C had cardiac surgery on CPB on 01/12/2012 at 2:00PM. She then came out of the operating room on vasoactive support. On 01/13/2012 at 2:00 AM she went on ECLS for cardiac support. Check cardiopulmonary bypass.</p>		07/01/2001 - present	ECLS.Support	SupportCodeId 201
Intra-aortic balloon	<p>This field records if a patient had an intra-aortic balloon pump utilized in the 24 hours prior to ECLS Start Time.</p> <p>Check Intra-aortic balloon pump if patient had one within 24 hours prior to ECLS Start Time.</p> <p>Patient Z had ECPR and was placed on ECPR then immediately after ECLS Start Time an intra-aortic balloon pump was placed. Do not check intra-aortic balloon pump as this was not a Pre-ECLS support.</p>		01/15/2018-present	ECLS.Support	SupportCodeId 103

Mechanical Cardiac Support Codes (continued)

Select each support that was employed prior to the ECLS Start Time. These generally refer to supports received within the 24 hours leading up to ECLS, though many of these supports may have been initiated days, or even months, prior to ECLS.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/Modification	Table Name	Column Name / Stored Values
Percutaneous Ventricular Assist Device	<p>This field collects if a patient had a percutaneously placed Ventricular Assist Device (VAD) support prior to ECLS.</p> <p>Check yes if patient had a percutaneously placed VAD such as Impella 2.5, Impella 5.0, PHP, Tandem Heart. Temporary ventricular assist device, is usually inserted percutaneously via a peripheral artery.</p> <p>Patient Y had a surgically placed VAD and then had an oxygenator cut in, converting him to ECLS. This patient did have Pre-ECLS VAD support, but Do NOT check yes for percutaneous Ventricular Assist Device, as the device was not percutaneous.</p>		02/01/1998-present	ECLS.Support	SupportCodeId 701
RVAD	<p>This field collects if a patient had a Right Ventricular Assist Device (RVAD) support prior to ECLS.</p> <p>Check RVAD if the right ventricle is supported with an implanted ventricular assist device.</p>		02/01/1998-present	ECLS.Support	SupportCodeId 203
LVAD	<p>This field collects if a patient had a Left Ventricular Assist Device (LVAD) support prior to ECLS.</p> <p>Check LVAD if left ventricle is supported with an implanted ventricular assist device.</p>		02/01/1998-present	ECLS.Support	SupportCodeId 202
BiVAD	<p>This field collects if a patient had a BiVentricular Assist Device (BiVAD) support prior to ECLS.</p> <p>Check BiVAD if both the right and left ventricles are supported with an implanted ventricular assist device.</p>		02/01/1998-present	ECLS.Support	SupportCodeId 204
Berlin Heart	<p>This field collects if a patient had a Berlin Heart Ventricular Assist Device support prior to ECLS.</p> <p>Check Berlin Heart if it is used for ventricular support prior to ECLS</p>		02/01/1998-present	ECLS.Support	SupportCodeId 205

Renal, Pulmonary and Other Support Codes

Select each support that was employed prior to the ECLS Start Time. These generally refer to supports received within the 24 hours leading up to ECLS, though some of these supports may have been initiated days prior to ECLS.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/Modification	Table Name	Column Name / Stored Values
Renal, Pulmonary and Other Support Codes	This field collects if any renal, pulmonary or other support codes were used prior to ECLS	Yes or No response mandatory for category	08/21/2018 – Present		
Renal Replacement Therapy	<p>This field collects if a patient required renal replacement therapy any time prior to ECLS.</p> <p>Check Renal Replacement Therapy if the patient requires renal replacement therapy (RRT) during the hospitalization or at baseline (this includes hemodialysis, continuous renal replacement therapy and peritoneal dialysis).</p> <p>Patient Y is dependent on chronic Hemodialysis at home and was admitted and went on ECLS prior to receiving hemodialysis in hospital.</p> <p>Patient Z is on home peritoneal dialysis (PD) and came in with septic shock and went on ECLS without receiving PD in hospital.</p> <p>Patient X has no baseline renal failure but developed acute kidney injury during the hospitalization and received RRT during the hospitalization prior to ECLS.</p> <p>For Patient X, Y and Z check Renal Replacement Therapy</p>		01/01/1989-present	ECLS.Support	SupportCodeId 502
Inhaled anesthetic	<p>This field collects if a patient inhaled anesthetic as a therapy within the 24 hours prior to the ECLS Start Time.</p> <p>Check inhaled anesthetic if it is used as a therapy such as for bronchodilation in the 24 hours prior to ECLS Start Time.</p>		02/01/1998-present	ECLS.Support	SupportCodeId 307
Inhaled epoprostenol	<p>This field collects if a patient inhaled epoprostenol as a therapy within the 24 hours prior to the ECLS Start Time.</p> <p>Check inhaled epoprostenol if the patient received inhaled epoprostenol in the 24 hours period prior to the ECLS Start Time for at least 6 hours.</p>		12/01/2017-present	ECLS.Support	SupportCodeId 711

Renal, Pulmonary and Other Support Codes (continued)

Select each support that was employed prior to the ECLS Start Time. These generally refer to supports received within the 24 hours leading up to ECLS, though some of these supports may have been initiated days prior to ECLS.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/Modification	Table Name	Column Name / Stored Values
Inhaled Nitric Oxide	<p>This field collects if a patient inhaled nitric oxide (INO) as a therapy within the 24 hours prior to the ECLS Start Time.</p> <p>Check INO if the patient received inhaled nitric oxide in the 24 hours period prior to the ECLS Start Time for at least 6 hours.</p>		02/01/1998-present	ECLS.Support	SupportCodeId 302
Prone Positioning	<p>This field collects if a patient received prone positioning as a respiratory therapy within the 24 hours prior to the ECLS Start Time.</p> <p>Guerin C, et al. Prone positioning in severe ARDS. <i>N Engl J Med.</i> 2013;368(23):2159-2168 described prone positioning as being placed “in a completely prone position for at least 16 consecutive hours.”</p> <p>Select Yes for Prone Positioning if these conditions are true for the patient within the 24 hours prior to ECLS Start Time.</p> <p>Patient A went on ECLS on 10/11/2017 at 2:00 PM. She was placed in the prone position from 10/09/2017 at 10:00 PM until 10/10/2017 at 4:00 PM, then she was placed supine and was not replaced in the prone position prior to going on ECLS. Select Yes.</p> <p>Patient Z went on ECLS on 10/11/2017 at 2:00 PM. He was placed in the prone position from 10/09/2017 at 10:00 PM until 6:00 AM on 10/10/2017. He was placed back in the prone position on 10/10/2017 at 10:00 PM until 6:00 AM on 10/11/2017. Select No.</p>		12/01/2017-present	ECLS.Support	SupportCodeId 702
Partial Liquid Ventilation	Select this if the patient had received intra-tracheal perfluorocarbon at any time during the hospitalization.		02/01/1998-present	ECLS.Support	SupportCodeId 304

Renal, Pulmonary and Other Support Codes (continued)

Select each support that was employed prior to the ECLS Start Time. These generally refer to supports received within the 24 hours leading up to ECLS, though some of these supports may have been initiated days prior to ECLS.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/Modification	Table Name	Column Name / Stored Values
Plasmapheresis	This field collects if the patient received therapeutic plasmapheresis within the 24 hours prior to ECLS Start Time. Check plasmapheresis if the patient's plasma was removed by filtration or centrifugation and replaced with other volume.		02/01/1998-present	ECLS.Support	SupportCodeId 501
Surfactant	This field collects if the patient received intra-tracheal surfactant within the 24 hours prior to ECLS Start Time. Check Surfactant if exogenous pulmonary surfactant directly delivered into the trachea.		02/01/1998-present	ECLS.Support	SupportCodeId 303
Therapeutic hypothermia < 35 degrees C	This field collects if the patient received therapeutic hypothermia within the 24 hours prior to the ECLS Start Time. Select yes if there was intentional cooling of the patient to < 35 C prior to the ECLS start time.		10/10/2011-present	ECLS.Support	SupportCodeId 306

Medications (excluding vasoactive infusions)

Select each that were employed within the 24 hours prior to placing the patient on ECLS.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/ Modification	Table Name	Column Name / Stored Values
Medications (excluding vasoactive infusions)	This field collects if any medications (excluding vasoactive infusions) were used prior to ECLS	Yes or No response mandatory for category	08/21/2018 – Present		
Alprostadil	This field collects if the patient received Alprostadil within the 24 hours prior to the ECLS Start Time. Prostaglandin E1 (Alprostadil) infusion maintains patency of the ductus arteriosus when required for ductal dependent congenital heart disease in the neonatal period. To qualify, the infusion must have been administered for at least 6 hours.		01/01/1989-present	ECLS.Support	SupportCodeId 612
Bicarbonate (Intravenous)	This field collects if the patient received intravenous bicarbonate within the 24 hours prior to the ECLS Start Time. Check if sodium bicarbonate was administered intravenously as a bolus for metabolic acidosis.		02/01/1998-present	ECLS.Support	SupportCodeId 403
Epoprostenol (all synthetic prostacyclin analogues)	This field collects if the patient received a synthetic prostacyclin analogue within the 24 hours prior to the ECLS Start Time. Check epoprostenol if any synthetic prostacyclin analogues, including epoprostenol infusion and treprostenil subcutaneously.		1/15/2018 - present	ECLS.Support	SupportCodeId 609
Narcotics	This field collects if the patient received continuous intravenous narcotics within the 24 hours prior to the ECLS Start Time. To qualify, the infusion must have been administered for at least 6 hours. Check narcotics if the patient had continuous infusion of narcotics.		01/01/1989-present	ECLS.Support	SupportCodeId 401
Neuromuscular blockers	This field collects if the patient received continuous intravenous neuromuscular blockade within the 24 hours prior to the ECLS Start Time. To qualify, the infusion must have been administered for at least 6 hours. Check neuromuscular blocker if the patient had continuous infusion of neuromuscular blockade.		02/01/1998-1/15/2018 1/15/2018-present specified infusion	ECLS.Support	SupportCodeId 402

Medications (excluding vasoactive infusions) (continued)

Select each that were employed 24 hours prior to placing the patient on ECLS.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/ Modification	Table Name	Column Name / Stored Values
Sildenafil	This field collects if the patient received sildenafil within the 24 hours prior to the ECLS Start Time. Check Sildenafil if the patient received systemically Sildenafil 24 hours prior to putting the patient on ECLS.		02/01/1998-present	ECLS.Support	SupportCodeld 610
Systemic Steroids	This field collects if the patient received systemic steroids within the 24 hours prior to the ECLS Start Time. Check systemic steroids if the patient received systemically glucocorticosteroids 24 hours prior to putting the patient on ECLS.		02/01/1998-present	ECLS.Support	SupportCodeld 613
THAM	This field collects if the patient received THAM within the 24 hours prior to the ECLS Start Time.		02/01/1998-present	ECLS.Support	SupportCodeld 404

Vasoactive Infusions

Select each infusion that was employed for at least 6 hours within 24 hours of the ECLS start time.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/Modification	Table Name	Column Name / Stored Values
Vasoactive Infusions	This field collects if any vasoactive medications were used prior to ECLS	Yes or No response mandatory for category	08/21/2018 – Present		
Dobutamine	This field collects if the patient received a dobutamine infusion within the 24 hours prior to the ECLS Start Time and delivered for at least 6 hours.		02/01/1998-present	ECLS.Support	SupportCodeId 602
Dopamine	This field collects if the patient received a dopamine infusion within the 24 hours prior to the ECLS Start Time and delivered for at least 6 hours.		02/01/1998-present	ECLS.Support	SupportCodeId 601
Enoximone	This field collects if the patient received an enoximone infusion within the 24 hours prior to the ECLS Start Time and delivered for at least 6 hours.		1/15/2018-present	ECLS.Support	SupportCodeId 703
Epinephrine	This field collects if the patient received an epinephrine infusion within the 24 hours prior to the ECLS Start Time and delivered for at least 6 hours.		02/01/1998-present	ECLS.Support	SupportCodeId 603
Esmolol	This field collects if the patient received an esmolol infusion within the 24 hours prior to the ECLS Start Time and delivered for at least 6 hours.		02/01/1998-present	ECLS.Support	SupportCodeId 705
Levosimendan	This field collects if the patient received a levosimendan infusion within the 24 hours prior to the ECLS Start Time and delivered for at least 6 hours.		02/01/1998-present	ECLS.Support	SupportCodeId 704
Metaraminol	This field collects if the patient received a metaraminol infusion within the 24 hours prior to the ECLS Start Time and delivered for at least 6 hours.		1/15/2018 - present	ECLS.Support	SupportCodeId 712
Metoprolol	This field collects if the patient received a metoprolol infusion within the 24 hours prior to the ECLS Start Time and delivered for at least 6 hours.		02/01/1998-present	ECLS.Support	SupportCodeId 706
Milrinone	This field collects if the patient received a milrinone infusion within the 24 hours prior to the ECLS Start Time and delivered for at least 6 hours.		02/01/1998-present	ECLS.Support	SupportCodeId 608

Vasoactive Infusions (continued)

Select each infusion that was employed for at least 6 hours within 24 hours of the ECLS start time.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/ Modification	Table Name	Column Name / Stored Values
Nicardipine	This field collects if the patient received a nicardipine infusion within the 24 hours prior to the ECLS Start Time and delivered for at least 6 hours.		02/01/1998-present	ECLS.Support	SupportCodeId 707
Nitroglycerin	This field collects if the patient received a nitroglycerin infusion within the 24 hours prior to the ECLS Start Time and delivered for at least 6 hours.		02/01/1998-present	ECLS.Support	SupportCodeId 708
Nitroprusside	This field collects if the patient received a nitroprusside infusion within the 24 hours prior to the ECLS Start Time and delivered for at least 6 hours.		02/01/1998-present	ECLS.Support	SupportCodeId 605
Norepinephrine	This field collects if the patient received a norepinephrine infusion within the 24 hours prior to the ECLS Start Time and delivered for at least 6 hours.		02/01/1998-present	ECLS.Support	SupportCodeId 604
Phenylephrine	This field collects if the patient received a phenylephrine infusion within the 24 hours prior to the ECLS Start Time and delivered for at least 6 hours.		1/15/2018-present	ECLS.Support	SupportCodeId 713
Tolazoline	This field collects if the patient received a tolazoline infusion within the 24 hours prior to the ECLS Start Time and delivered for at least 6 hours.		02/01/1998-present	ECLS.Support	SupportCodeId 607
Vasopressin	This field collects if the patient received a vasopressin infusion within the 24 hours prior to the ECLS Start Time and delivered for at least 6 hours.		1/15/2018-present	ECLS.Support	SupportCodeId 709

Pre-ECLS Support Types <i>no longer collected</i>					
Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/ Modification	Table Name	Column Name / Stored Values
Abdominal compression			01/01/1989- 12/01/2017		105
AVCO2R			01/01/1989- 12/01/2017		206
ECMO			101/01/1989- 12/01/2017		207
High frequency ventilation/oscillation			01/01/1989- 12/01/2017		301
Hyperventilation			01/01/1989- 12/01/2017		305
Vasopressor/inotropic drug			01/01/1989- 12/01/2017		101

5. ECLS ASSESSMENT

This section details the values for a patient on ECLS closest to 24 hours after the ECLS Start Time. If data at 24 hours is not available, then give the data closest to 24 hours after initiation of ECLS (no less than 18 after the ECLS Start Time and no more than 30 hours after ECLS Start Time).

24-hour ECLS Arterial Blood Gas

Choose the arterial blood gas that meets the following 3 criteria:

1. Drawn after the ECLS Start Time
2. Drawn no less than 18 hours after the ECLS Start Time and no more than 30 hours after ECLS Start Time
3. If multiple arterial blood gases exist in this time period, choose the ECLS arterial blood gas closest to 24 hours after the ECLS Start Time.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/Modification	Table Name	Column Name / Stored Values
24-hour ECLS Blood Gas Date/Time	<p>This field collects the date and time of the arterial blood gas that meets the timing criteria for the 24-hour ECLS Arterial Blood Gas defined above.</p> <p>Patient M had an ECLS start time of 03/29/2017 02:00AM He had the following 4 blood gases following shorthand: pH/PaCO₂/PaO₂/HCO₃/SaO₂ Lactate=X, FiO₂ delivered=X</p> <p>ABG at 03/29/2017 7:00PM 7.41/40/80/24/98% Lactate 1 FiO₂ delivered = 30%</p> <p>ABG at 03/29/2017 at 11:30 PM 7.42/41/82/25/99% Lactate 1 FiO₂ delivered = 30%</p> <p>ABG at 03/30/2017 3:00AM 7.39/39/81/25/100% Lactate 1 FiO₂ delivered = 30%</p> <p>ABG at 03/30/2017 8:30AM 7.38/38/82/23/99% Lactate 1 FiO₂ delivered = 30%</p> <p>ABG on 03/29/2017 at 7:00 PM is ineligible because it less than 18 hours after the ECLS Start Time. ABG on 3/30/2017 at 8:30 AM is ineligible because it is > 30 hours after ECLS Start Time. Enter 24-hour ECLS Arterial Blood Gas Date/Time at 03/30/2017 3:00AM because it is the ABG closest to the 24 hours after the ECLS Start Time. Use all values for pH, PaCO₂, PaO₂, HCO₃, SaO₂, Lactate, from the same ABG and report the FiO₂ at the time the ABG was drawn.</p>	<p>Soft Notification: 24-hour ECLS Blood Gas Date/Time must be no less than 18 hrs AFTER ECLS Start Time and no more than 30 hrs AFTER the ECLS Start Time.</p> <p>Hard Limit: 24-hour ECLS Blood Gas Date/Time must be AFTER the ECLS Start Time.</p> <p>24-hour ECLS Blood Gas Date/Time cannot be AFTER the Date of Death</p> <p>24-hour ECLS Blood Gas Date/Time cannot be AFTER 48 hours</p> <p>24-hour ECLS Blood Gas Date/Time cannot be earlier than the Date of Birth.</p>	<p>01/01/1989-1/15/2018 collect best value</p> <p>1/15/2018-present collect value on ECLS closest to 24 hours of ECLS</p>	ECLS.BloodGases	Time

24-hour ECLS Arterial Blood Gas (continued)

Choose the arterial blood gas that meets the following 3 criteria:

1. Drawn after the ECLS Start Time
2. Drawn no less than 18 hours after the ECLS Start Time and no more than 30 hours after ECLS Start Time
3. If multiple arterial blood gases exist in this time period, choose the ECLS arterial blood gas closest to 24 hours after the ECLS Start Time.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/ Modification	Table Name	Column Name / Stored Values
pH	<p>This field collects the pH that meets the timing criteria for the 24-hour ECLS Arterial Blood Gas defined above. As this is part of the minimum dataset, if this information is unknown or unavailable check the appropriate box.</p> <p>pH is the potential of hydrogen (negative of the base 10 logarithm of the activity of the hydrogen ion) in the arterial blood sample.</p>	<p>Precision 2 decimal points</p> <p>Soft Notification: < 6.90 or > 7.50</p> <p>Hard Limit: <6.00 or > 8.00</p> <p>This is part of the minimum dataset because it is incorporated into risk adjustment models.</p>	<p>01/01/1989-1/15/2018 collect best value</p> <p>1/15/2018- present collect value on ECLS closest to 24 hours of ECLS</p> <p>8/9/2018-present pH made mandatory data field if available and ECLS duration greater than or equal to 24 hours, Unavailable/unknown checkbox added</p>	ECLS.BloodGases	pH
PaCO ₂	<p>This field collects the arterial partial pressure of carbon dioxide (PaCO₂) that meets the timing criteria for the 24-hour ECLS Arterial Blood Gas defined above.</p> <p>PaCO₂ is the arterial partial pressure of carbon dioxide in mm Hg.</p>	<p>US units of Entry Precision whole number</p> <p>Soft Notification: < 30 mm Hg or > 100 mm Hg</p> <p>Hard Limit: < 10 mm Hg or > 250 mm Hg</p> <p>International Units Precision 2 decimal points</p> <p>Soft Notification: < 4.00 kPa or > 13.33 kPa</p> <p>Hard Limit: < 1.33 kPa or > 33.33 kPa</p>	<p>01/01/1989-1/15/2018 collect best value</p> <p>1/15/2018- present collect value on ECLS closest to 24 hours of ECLS</p>	ECLS.BloodGases	PCO2

24-hour ECLS Arterial Blood Gas (continued)

Choose the arterial blood gas that meets the following 3 criteria:

1. Drawn after the ECLS Start Time
2. Drawn no less than 18 hours after the ECLS Start Time and no more than 30 hours after ECLS Start Time
3. If multiple arterial blood gases exist in this time period, choose the ECLS arterial blood gas closest to 24 hours after the ECLS Start Time.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/Modification	Table Name	Column Name / Stored Values
PaO ₂	<p>This field collects the arterial partial pressure oxygen (PaO₂) that meets the timing criteria for the 24-hour ECLS Arterial Blood Gas defined above.</p> <p>PaO₂ is the arterial partial pressure of oxygen in mm Hg.</p>	<p>US units of Entry Precision whole number Soft Notification: < 20 mm Hg or > 300 mm Hg Hard Limit: < 0 mm Hg or > 760 mm Hg</p> <p>International Units Precision 2 decimal points Soft Notification: < 2.66 kPa or > 40.00 kPa Hard Limit: < 0 kPa or > 101.31 kPa</p>	<p>01/01/1989-1/15/2018 collect best value</p> <p>1/15/2018- present collect value on ECLS closest to 24 hours of ECLS</p>	ECLS.BloodGases	PO2
HCO ₃	<p>This field collects the arterial standard bicarbonate (HCO₃) that meets the timing criteria for the 24-hour ECLS Arterial Blood Gas defined above. As this is part of the minimum dataset, if this information is unknown or unavailable check the appropriate box.</p> <p>HCO₃ is the Standard bicarbonate concentration mEq/L or mmol/L</p>	<p>US units of Entry Precision whole number Soft Notification: < 10 mEq/L or > 40 mEq/L Hard Limit: < 0 mEq/L or > 70 mEq/L</p> <p>International units Precision whole number Soft Notification: < 10 mmol/L or > 40 mmol/L Hard Limit: < 0 mmol/L or > 70 mmol/L</p> <p>This is part of the minimum dataset because it is incorporated into risk adjustment models.</p>	<p>01/01/1989-1/15/2018 collect best value</p> <p>1/15/2018- present collect value on ECLS closest to 24 hours of ECLS</p> <p>8/9/2018-present HCO₃ made mandatory data field if available and ECLS duration greater than or equal to 24 hours, Unavailable/unknown checkbox added</p>	ECLS.BloodGases	HCO3

24-hour ECLS Arterial Blood Gas (continued)

Choose the arterial blood gas that meets the following 3 criteria:

1. Drawn after the ECLS Start Time
2. Drawn no less than 18 hours after the ECLS Start Time and no more than 30 hours after ECLS Start Time
3. If multiple arterial blood gases exist in this time period, choose the ECLS arterial blood gas closest to 24 hours after the ECLS Start Time.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/Modification	Table Name	Column Name / Stored Values
SaO ₂ (%)	<p>This field collects the arterial oxyhemoglobin saturation that meets the timing criteria for the 24-hour ECLS Arterial Blood Gas defined above.</p> <p>SaO₂ is the percent arterial blood oxyhemoglobin saturation from arterial blood gas.</p>	<p>Units of measure for US and International is % Precision whole number</p> <p>Soft Notification: <50% or > 100% Hard Limit: <1% or > 100%</p>	<p>01/01/1989-1/15/2018 collect best value</p> <p>1/15/2018-present collect value on ECLS closest to 24 hours of ECLS</p>	ECLS.BloodGases	SaO2
SpO ₂ (%)	<p>This field collects the peripheral oxyhemoglobin saturation that meets the timing criteria for the 24-hour ECLS Arterial Blood Gas defined above.</p> <p>However, this is not a blood gas measurement, it is the noninvasive pulse oximeter measured oxyhemoglobin saturation.</p>	<p>Units of measure for US and International is % Precision whole number</p> <p>Soft Notification: <50% or > 100% Hard Limit: <1% or > 100%</p>	<p>1/15/2017-present Closest to ECLS start AND pre-ECLS</p>	ECLS.BloodGases	SpO2
Lactate	<p>This field collects the highest serum lactate concentration from an arterial blood gas arterial oxyhemoglobin saturation that meets the timing criteria for the 24-hour ECLS Arterial Blood Gas defined above.</p> <p>If not all blood gases do not collect lactate, it can be drawn separately from the other arterial blood gas values, but it still needs to fall in the above described time period for 24 hour Arterial Blood Gas.</p>	<p>Units of measure for US and International is mmol/L</p> <p>Soft Notification: <0mmol/L or >20 mmol/l Hard Limit: <0mmol/L or >40 mmol/l</p>	<p>01/01/2017-1/15/2018 collect best value</p> <p>1/15/2018-present collect value on ECLS closest to 24 hours of ECLS</p>	ECLS.BloodGases	Lactate
FiO ₂	<p>This field collects the percentage of inspired oxygen at the time the 24-hour ECLS Arterial Blood Gas was drawn.</p>	<p>Units of measure for US and International is % Precision whole number</p> <p>Soft Notification:</p>	<p>01/01/1989-1/15/2018</p>	ECLS.VentSettings	FiO2

	<p>FiO₂ is the percentage of inspired oxygen from the ventilator or other supplemental oxygen at the time the blood gas was obtained.</p>	<p><21% or > 100% Hard Limit: <10% or > 100%</p>	<p>collect best value 1/15/2018-present collect value on ECLS closest to 24 hours of ECLS</p>		
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24-hour ECLS Ventilator Settings

Choose the Ventilator Settings that meets the following 3 criteria:

1. Collected after the ECLS Start Time
2. Collected no less than 18 hours after the ECLS Start Time and no more than 30 hours after ECLS Start Time
3. If multiple ventilator settings exist in this time period, choose the Ventilator Settings closest to 24 hours after the ECLS Start Time.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/Modification	Table Name	Column Name / Stored Values
24-hour ECLS Vent Settings Date/Time	<p>This field collects the date and time of the ventilator settings that meet the timing criteria for the 24-hour ECLS Ventilator Settings defined above.</p> <p>Patient M had an ECLS start time of 03/29/2017 02:00AM He had the following 4 reports of ventilation support. All pressure measurements are reported in cm of water.</p> <p>Settings at 03/29/2017 7:00PM Conventional Mechanical Ventilator (CMV) in Pressure Control (PC) with Assist Control (AC) with settings: set rate 10, PIP 25, PEEP 15, FiO₂ 30% measured MAP 18.</p> <p>Settings at 03/29/2017 at 11:30 PM CMV PC/AC with settings: rate 10, PIP 25, PEEP 15, FiO₂ 30% measured MAP 18.</p> <p>Settings at 03/30/2017 3:00AM CMV PC/AC with settings: rate 10, PIP 25, PEEP 15, FiO₂ 30% MAP 18.</p> <p>Settings at 03/30/2017 8:30AM CMV PC/AC with settings: rate 10, PIP 25, PEEP 15, FiO₂ 30% measured MAP 18.</p> <p>24-hour ECLS Ventilator Settings at 03/29/2017 7:00PM and at 03/30/2017 8:30AM are ineligible because they are less than 18 hours after the ECLS Start Time and more than 30 hours after the ECLS Start Time, respectively. Choose 03/30/2017 3:00AM for the 24-hour ECLS Vent Date/Time and enter the appropriate settings from that date and time in the fields below.</p>	<p>Soft Notification: 24-hour ECLS Vent Settings Date/Time must be no less than 18 hrs AFTER ECLS Start Time and no more than 30 hrs AFTER the ECLS Start Time.</p> <p>Hard Limit: 24-hour ECLS Vent Settings Date/Time must be AFTER the ECLS Start Time.</p> <p>24-hour ECLS Vent Settings Date/Time cannot be earlier than the Date of Birth.</p> <p>24-hour ECLS Vent Settings Date/Time cannot be after the Date of Death.</p>	<p>01/01/1989-1/15/2018 collect best value</p> <p>1/15/2018-present collect value on ECLS closest to 24 hours of ECLS</p>	ECLS.VentSettings	Time

24-hour ECLS Ventilator Settings (continued)

Choose the Ventilator Settings that meets the following 3 criteria:

1. Collected after the ECLS Start Time
2. Collected no less than 18 hours after the ECLS Start Time and no more than 30 hours after ECLS Start Time
3. If multiple ventilator settings exist in this time period, choose the Ventilator Settings closest to 24 hours after the ECLS Start Time.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/ Modification	Table Name	Column Name / Stored Values
Ventilator Type	<p>This field collects the type of mechanical ventilation at the timing that meet the criteria for the 24-hour ECLS Ventilator Settings defined above.</p> <p>Select one from the drop down Other if type known but unspecified Conventional = Conventional mechanical ventilation includes pressure control, pressure regulated volume control, volume control, and inverse ratio ventilation such as airway pressure release ventilation. HFO = High frequency oscillatory ventilation Other HFV = other high frequency ventilator = High frequency jet ventilation, percussive ventilation No Ventilator = No ventilator was in use Unknown if type unknown</p>	<p>This is part of the minimum dataset because it is incorporated into risk adjustment models.</p>	<p>01/01/1989-1/15/2018 collect best value</p> <p>1/15/2018- present collect value on ECLS closest to 24 hours of ECLS</p> <p>8/9/2018-present Ventilator Type made mandatory data field if ECLS duration greater than or equal to 24 hours</p>	ECLS.VentSettings	<p>VentTypeId</p> <p>As defined on X-Walk Table</p> <p>VentTypes</p> <p>0 = Other 1 = Conventional 2 = HFO 3 = OtherHFV 4 = No Ventilator 5 = Unknown</p>
Conventional Rate	<p>This field collects the set respiratory rate in breaths per minute for conventional ventilation at the timing criteria for Pre-ECLS Ventilator Settings defined above.</p> <p>You can only record a conventional rate if you choose the type of ventilator to be conventional, other HFV or other.</p>	<p>Units of measure is breaths per minute (bpm) Precision whole number Soft Notification: < 10 bpm or > 40 bpm Hard Limit: < 0 bpm or > 125 bpm</p>	<p>01/01/1989-1/15/2018 collect best value. Only one rate field</p> <p>1/15/2018- present collect value on ECLS closest to 24 hours of ECLS. Separated conventional and HFV rate.</p>	ECLS.VentSettings	Rate

24-hour ECLS Ventilator Settings (continued)

Choose the Ventilator Settings that meets the following 3 criteria:

1. Collected after the ECLS Start Time
2. Collected no less than 18 hours after the ECLS Start Time and no more than 30 hours after ECLS Start Time
3. If multiple ventilator settings exist in this time period, choose the Ventilator Settings closest to 24 hours after the ECLS Start Time.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/Modification	Table Name	Column Name / Stored Values
HFV Rate	<p>This field collects the set high frequency ventilation rate in Hertz (Hz) = breaths per second. at the timing criteria for Pre-ECLS Ventilator Settings defined above.</p> <p>You can only record a HFV rate if you choose HFV, other HFV or other.</p>	<p>Units of measure is Hertz (Hz) Precision one decimal point</p> <p>Soft Notification: <3 Hz or > 17 Hz</p> <p>Hard Limit: <3 Hz or > 17 Hz</p>	<p>01/01/1989-1/15/2018 collect best value</p> <p>1/15/2018- present collect value on ECLS closest to 24 hours of ECLS. Separated conventional and HFV rate.</p>	ECLS.VentSettings	HighFrequencyRate
MAP	<p>This field collects the Mean Airway Pressure (MAP) in centimeters of water at the timing that meets the criteria for 24-hour ECLS Ventilator Settings defined above.</p> <p>The MAP is a measured variable in conventional mechanical ventilation and a set variable in HFOV.</p>	<p>Units of measure is cm H₂O Precision whole number</p> <p>Soft Notification: < 10 cm H₂O or > 30 cm H₂O</p> <p>Hard Limit: < 0 cm H₂O or > 60 cm H₂O</p>	<p>01/01/1989-1/15/2018 collect best value</p> <p>1/15/2018- present collect value on ECLS closest to 24 hours of ECLS</p>	ECLS.VentSettings	MAP

24-hour ECLS Ventilator Settings (continued)

Choose the Ventilator Settings that meets the following 3 criteria:

1. Collected after the ECLS Start Time
2. Collected no less than 18 hours after the ECLS Start Time and no more than 30 hours after ECLS Start Time
3. If multiple ventilator settings exist in this time period, choose the Ventilator Settings closest to 24 hours after the ECLS Start Time.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/ Modification	Table Name	Column Name / Stored Values
PIP	<p>This field collects the Peak Inspiratory Pressure (PIP), at the timing that meets the criteria for 24-hour ECLS Ventilator Settings defined above.</p> <p>The Peak Inspiratory Pressure (PIP) used in conventional pressure control, pressure regulated volume control, volume control and the Phigh in inverse ratio ventilation such as airway pressure release ventilation.</p>	<p>PIP is displayed for conventional, other HFV, and other Units of measure is cm H₂O Precision whole number</p> <p>Soft Notification: < 10 cm H₂O or > 45 cm H₂O</p> <p>Hard Limit: PIP must be greater than or equal to MAP PIP must be greater than or equal to PEEP</p> <p>< 0 cm H₂O or > 80 cm H₂O</p>	<p>01/01/1989-1/15/2018 collect best value. Amplitude and PIP in same data entry field.</p> <p>1/15/2018- present collect value on ECLS closest to 24 hours of ECLS. Separated data fields for PIP and Amplitude.</p>	ECLS.VentSettings	PIP
Amplitude	<p>This field collects the Amplitude or Delta Pressure (DP), at the timing that meets the criteria for 24-hour ECLS Ventilator Settings defined above.</p> <p>High Frequency Amplitude used in high frequency oscillatory ventilation or other high frequency ventilation or other.</p>	<p>Amplitude is displayed for HFO, other HFV, and other</p> <p>Units of measure is cm H₂O Precision whole number</p> <p>Soft Notification: < 30 cm H₂O or > 90 cm H₂O</p> <p>Hard Limit: < 10 cm H₂O or > 100 cm H₂O</p>	<p>01/01/1989-1/15/2018 collect best value. Amplitude and PIP in same data entry field.</p> <p>1/15/2018- present collect value on ECLS closest to 24 hours of ECLS. Separated data fields for PIP and Amplitude.</p>	ECLS.VentSettings	DeltaP

24-hour ECLS Ventilator Settings (continued)

Choose the Ventilator Settings that meets the following 3 criteria:

1. Collected after the ECLS Start Time
2. Collected no less than 18 hours after the ECLS Start Time and no more than 30 hours after ECLS Start Time
3. If multiple ventilator settings exist in this time period, choose the Ventilator Settings closest to 24 hours after the ECLS Start Time.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/Modification	Table Name	Column Name / Stored Values
PEEP	<p>This field collects the positive end-expiratory pressure (PEEP) at the timing that meets the criteria for 24-hour ECLS Ventilator Settings defined above.</p> <p>PEEP can only be collected when a patient is in conventional, other high frequency ventilation or other.</p>	<p>PEEP is displayed for displayed for conventional, other HFV, and other</p> <p>Units of measure is cm H₂O Precision whole number</p> <p>Soft Notification: < 5 cm H₂O or > 25 cm H₂O</p> <p>Hard Limit: < 0 cm H₂O or > 40 cm H₂O</p>	<p>01/01/1989-1/15/2018 collect best value</p> <p>1/15/2018-present collect value on ECLS closest to 24 hours of ECLS</p>	ECLS.VentSettings	PEEP
Hand Bag Valve Ventilation	<p>This field collects if the patient received hand bag valve ventilation through an invasive airway, between 18 hours and 30 hours after ECLS Start Time.</p> <p>Select yes, no or unknown from the drop down menu</p>		<p>01/01/1989-1/15/2018 collect best value</p> <p>1/15/2018-present collect value on ECLS closest to 24 hours of ECLS</p>	ECLS.VentSettings	<p>HandBagging</p> <p>0 = No 1 = Yes -1 = Unknown Missing = "Null"</p>

24-hour ECLS Hemodynamics

This section details hemodynamic values for a patient closest to 24 hours after the ECLS Start Time. The data must be collected at least 18 hours after the ECLS Start Time and no more than 30 hours after the ECLS Start Time.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/Modification	Table Name	Column Name / Stored Values
24-hour ECLS Hemodynamics Date/Time	<p>This field collects the date and time that the Systolic Blood Pressure (SBP), Diastolic Blood Pressure (DBP) and Mean Blood Pressure (Mean BP) were simultaneously collected in accordance with 24-hour ECLS Hemodynamics timing criteria defined above.</p> <p>The Pre-ECLS Hemodynamics Date/Time should refer to the date and time of the Systolic Blood Pressure (SBP), Diastolic Blood Pressure (DBP) and Mean Blood Pressure (Mean BP) which all should be measured at the same time. If a patient has an invasive arterial line that is measuring blood pressure, please report values from the arterial line. If the patient does not have invasive arterial blood pressure monitoring during the specified time period, then use noninvasive blood pressure monitoring values that fall in the correct timeframe.</p> <p>Patient M had an ECLS start time of 03/29/2017 02:00AM He had the following 4 reports of blood pressure. Reported as SBP/DBP (Mean BP) in mm Hg On 03/29/2017 at 7:00PM Arterial BP 60/40 (53)</p> <p>On 03/29/2017 at 11:30 PM Arterial BP 70/40 (58) On 03/30/2017 at 3:00AM Noninvasive BP 62/42 (55) On 03/30/2017 at 8:30AM Arterial BP 80/50 (65)</p> <p>Enter 24-hour Hemodynamics Date/Time 03/29/2017 11:30 PM and enter the Arterial Systolic BP 70 mm Hg, Diastolic BP 40 mm Hg and Mean BP 58 mm Hg. blood pressure on 03/29/2017 at 7:00 PM was 17 hours after the ECLS Start Time and the blood pressure on 03/30/2017 at 8:30AM was 30.5 hour after the ECLS Start Time and therefore both were ineligible. Even though the noninvasive BP was closer to 24 hours after the ECLS Start Time, we prioritized the blood pressure that was arterial and also fell in the window.</p>	<p>Soft Notification: 24-hour ECLS Hemodynamics Date/Time must be no less than 18 hrs AFTER ECLS Start Time and no more than 30 hrs AFTER the ECLS Start Time.</p> <p>Hard Limit: 24-hour ECLS Hemodynamics Date/Time must be AFTER the ECLS Start Time.</p> <p>24-hour ECLS Hemodynamics Date/Time cannot be earlier than the Date of Birth.</p> <p>24-hour ECLS Hemodynamics Date/Time cannot be after the Date of Death.</p>	<p>01/01/1998-12/1/2011 data recommended for collection on neonates only though it was collected on non-neonatal patients</p> <p>12/1/2011-1/15/2018 data recommended for all age groups and recommended to be collected as worst value.</p> <p>1/15/2018-present Closest to ECLS start AND pre-ECLS.</p>	ECLS.Hemodynamics	Time

24-hour ECLS Hemodynamics (continued)

This section details hemodynamic values for a patient closest to 24 hours after the ECLS Start Time. The data must be collected at least 18 hours after the ECLS Start Time and no more than 30 hours after the ECLS Start Time.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/Modification	Table Name	Column Name / Stored Values
Systolic BP	<p>This field collects the systolic blood pressure (SBP) that meets the 24-hour Hemodynamics timing criteria defined above.</p> <p>Enter the systolic of a single measurement of blood pressure. If an arterial blood pressure and non-invasive cuff pressure exist, please choose the arterial pressure monitor.</p> <p>As this is part of the minimum dataset, if this information is unknown or unavailable check the appropriate box.</p>	<p>Units of measure are mm Hg Precision: whole number</p> <p>Neonate (0-28 days) Soft Notification: < 30 mm Hg or > 90 mm Hg Hard Limit: < 0 mm Hg or > 150 mm Hg</p> <p>Pediatric (29 days – 17 yrs) Soft Notification: < 50 mm Hg or > 180 mm Hg Hard Limit: < 0 mm Hg or > 250 mm Hg</p> <p>Adult (≥ 18 yrs) Soft Notification: < 50 mm Hg or > 180 mm Hg Hard Limit: < 0 mm Hg or > 300 mm Hg</p> <p>This is part of the minimum dataset because it is incorporated into risk adjustment models.</p>	<p>01/01/1998-12/1/2011 data recommended for collection on neonates only though it was collected on non-neonatal patients</p> <p>12/1/2011-1/15/2018 data recommended for all age groups and recommended to be collected as worst value.</p> <p>1/15/2018-present Closest to ECLS start AND pre-ECLS.</p> <p>8/9/2018-present SBP made mandatory data field if available and ECLS duration greater than or equal to 24 hours, Unavailable/unknown checkbox added</p>	ECLS.Hemodynamics	SBP

24-hour ECLS Hemodynamics (continued)

This section details hemodynamic values for a patient closest to 24 hours after the ECLS Start Time. The data must be collected at least 18 hours after the ECLS Start Time and no more than 30 hours after the ECLS Start Time.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/Modification	Table Name	Column Name / Stored Values
Diastolic BP	<p>This field collects the diastolic blood pressure (DBP) that meets the 24-hour Hemodynamics timing criteria defined above.</p> <p>Enter the diastolic of a single measurement of blood pressure. If an arterial blood pressure and non-invasive cuff pressure exist please choose the arterial pressure monitor.</p> <p>As this is part of the minimum dataset, if this information is unknown or unavailable check the appropriate box.</p>	<p>Units of measure are mm Hg Precision: whole number</p> <p>Neonate (0-28 days) Soft Notification: < 15 mm Hg or > 80 mm Hg Hard Limit: < 0 mm Hg or > 150 mm Hg</p> <p>Pediatric (29 days – 17 yrs) Soft Notification: < 20 mm Hg or > 150 mm Hg Hard Limit: < 0 mm Hg or > 200 mm Hg</p> <p>Adult (≥ 18 yrs) Soft Notification: < 30 mm Hg or > 180 mm Hg Hard Limit: < 0 mm Hg or > 250 mm Hg</p> <p>All Ages Hard Limit: The Diastolic BP cannot be greater than the Systolic BP.</p> <p>This is part of the minimum dataset because it is incorporated into risk adjustment models.</p>	<p>01/01/1998-12/1/2011 data recommended for collection on neonates only though it was collected on non-neonatal patients</p> <p>12/1/2011-1/15/2018 data recommended for all age groups and recommended to be collected as worst value.</p> <p>1/15/2018-present Closest to ECLS start AND pre-ECLS.</p> <p>8/9/2018-present DBP made mandatory data field if available and ECLS duration greater than or equal to 24 hours, Unavailable/unknown checkbox added</p>	ECLS.Hemodynamics	DBP

24-hour ECLS Hemodynamics (continued)

This section details hemodynamic values for a patient closest to 24 hours after the ECLS Start Time. The data must be collected at least 18 hours after the ECLS Start Time and no more than 30 hours after the ECLS Start Time.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/ Modification	Table Name	Column Name / Stored Values
Mean BP	<p>This field collects the mean blood pressure (Mean BP) that meets the 24-hour Hemodynamics timing criteria defined above.</p> <p>Enter the mean of a single measurement of blood pressure. If an arterial blood pressure and non-invasive cuff pressure exist, please choose the arterial pressure monitor.</p>	<p>Units of measure are mm Hg Precision: whole number</p> <p>Neonate (0-28 days) Soft Notification: < 20 mm Hg or > 70 mm Hg Hard Limit: < 0 mm Hg or > 150 mm Hg</p> <p>Pediatric (29 days – 17 yrs) Soft Notification: < 30 mm Hg or > 150 mm Hg Hard Limit: < 0 mm Hg or > 200 mm Hg</p> <p>Adult (≥ 18 yrs) Soft Notification: < 30 mm Hg or > 180 mm Hg Hard Limit: < 0 mm Hg or > 250 mm Hg</p> <p>Hard Limit: The Mean BP must be greater than or equal to the Diastolic BP The Mean BP must be less than or equal to the Systolic BP</p>	<p>01/01/1998- 12/1/2011 data recommended for collection on neonates only though it was collected on non-neonatal patients</p> <p>12/1/2011-1/15/2018 data recommended for all age groups and recommended to be collected as worst value.</p> <p>1/15/2018-present Closest to ECLS start AND pre-ECLS.</p>	ECLS.Hemodynamics	MAP

24-hour ECLS Hemodynamics (continued)

This section details hemodynamic values for a patient closest to 24 hours after the ECLS Start Time. The data must be collected at least 18 hours after the ECLS Start Time and no more than 30 hours after the ECLS Start Time.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/ Modification	Table Name	Column Name / Stored Values
SvO2	<p>This field collects the mixed venous oxygen saturation (SvO₂) of the patient's blood that meets the 24-hour Hemodynamics timing criteria defined above.</p> <p>Enter the lowest SvO₂ measured, ideally from the right atrium, but it is acceptable to enter SvO₂ from any central line.</p>	<p>Units of measure % of hemoglobin oxygen saturation Precision: whole number</p> <p>Soft Notification: < 20% or > 80 %</p> <p>Hard Limit: < 0 % or > 100 %</p>	<p>01/01/1998- 12/1/2011 data recommended for collection on neonates only though it was collected on non-neonatal patients</p> <p>12/1/2011-1/15/2018 data recommended for all age groups and recommended to be collected as worst value.</p> <p>1/15/2018-present Closest to ECLS start AND pre-ECLS.</p>	ECLS.Hemodynamics	SvO2

24-hour ECLS Hemodynamics (continued)

This section details hemodynamic values for a patient closest to 24 hours after the ECLS Start Time. The data must be collected at least 18 hours after the ECLS Start Time and no more than 30 hours after the ECLS Start Time.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/ Modification	Table Name	Column Name / Stored Values
PCWP	<p>This field collects the Pulmonary Capillary Wedge Pressure (PCWP) that meets the 24-hour Hemodynamics timing criteria defined above.</p> <p>Enter the highest PCWP measured with an indwelling pulmonary artery catheter.</p>	<p>Units of measure mm Hg Precision: whole number</p> <p>Neonate (0-28 days) Soft Notification: < 0 mm Hg or > 30 mm Hg Hard Limit: < 0 mm Hg or > 100 mm Hg</p> <p>Pediatric and Adult (> 29 days) Soft Notification: < 0 mm Hg or > 45 mm Hg Hard Limit: < 0 mm Hg or > 100 mm Hg</p>	<p>01/01/1998- 12/1/2011 data recommended for collection on neonates only though it was collected on non-neonatal patients</p> <p>12/1/2011-1/15/2018 data recommended for all age groups and recommended to be collected as worst value.</p> <p>1/15/2018-present Closest to ECLS start AND pre-ECLS.</p>	ECLS.Hemodynamics	PCWP
Systolic PAP	<p>This field collects the Systolic Pulmonary Arterial Pressure (Systolic PAP) that meets the 24-hour Hemodynamics timing criteria defined above.</p> <p>Enter the highest systolic PAP measured with an indwelling pulmonary artery catheter.</p>	<p>Units of measure mm Hg Precision: whole number</p> <p>Neonate (0-28 days) Soft Notification: < 5 mm Hg or > 50 mm Hg Hard Limit: < 0 mm Hg or > 100 mm Hg</p> <p>Pediatric and Adult (> 29 days) Soft Notification: < 5 mm Hg or > 90 mm Hg Hard Limit: < 0 mm Hg or > 150 mm Hg</p>	<p>01/01/1998- 12/1/2011 data recommended for collection on neonates only though it was collected on non-neonatal patients</p> <p>12/1/2011-1/15/2018 data recommended for all age groups and recommended to be collected as worst value.</p> <p>1/15/2018-present Closest to ECLS start AND pre-ECLS.</p>	ECLS.Hemodynamics	SPAP

24-hour ECLS Hemodynamics (continued)

This section details hemodynamic values for a patient closest to 24 hours after the ECLS Start Time. The data must be collected at least 18 hours after the ECLS Start Time and no more than 30 hours after the ECLS Start Time.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/ Modification	Table Name	Column Name / Stored Values
Diastolic PAP	<p>This field collects the Diastolic Pulmonary Arterial Pressure (Diastolic PAP) that meets the 24-hour Hemodynamics timing criteria defined above.</p> <p>Enter the highest diastolic PAP measured with an indwelling pulmonary artery catheter.</p>	<p>Units of measure mm Hg Precision: whole number</p> <p>Neonate (0-28 days) Soft Notification: < 1 mm Hg or > 40 mm Hg Hard Limit: < 0 mm Hg or > 80 mm Hg</p> <p>Pediatric and Adult (> 29 days) Soft Notification: < 2 mm Hg or > 80 mm Hg Hard Limit: < 0 mm Hg or > 130 mm Hg</p> <p>All Ages Hard Limit: Diastolic PAP cannot be greater than Systolic PAP.</p>	<p>01/01/1998- 12/1/2011 data recommended for collection on neonates only though it was collected on non-neonatal patients</p> <p>12/1/2011-1/15/2018 data recommended for all age groups and recommended to be collected as worst value.</p> <p>1/15/2018-present Closest to ECLS start AND pre-ECLS.</p>	ECLS.Hemodynamics	DPAP

24-hour ECLS Hemodynamics (continued)

This section details hemodynamic values for a patient closest to 24 hours after the ECLS Start Time. The data must be collected at least 18 hours after the ECLS Start Time and no more than 30 hours after the ECLS Start Time.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/ Modification	Table Name	Column Name / Stored Values
Mean PAP	<p>This field collects the Mean Pulmonary Arterial Pressure (Mean PAP) that meets the 24-hour Hemodynamics timing criteria defined above.</p> <p>Enter the highest Mean PAP measured with an indwelling pulmonary artery catheter.</p>	<p>Units of measure mm Hg Precision: whole number</p> <p>Neonate (0-28 days) Soft Notification: < 2 mm Hg or > 45 mm Hg Hard Limit: < 0 mm Hg or > 85 mm Hg</p> <p>Pediatric and Adult (> 29 days) Soft Notification: < 2 mm Hg or > 80 mm Hg Hard Limit: < 0 mm Hg or > 140 mm Hg</p> <p>Hard Limit: The Mean PAP must be greater than or equal to the Diastolic PAP The Mean PAP must be less than or equal to the Systolic PAP</p>	<p>01/01/1998- 12/1/2011 data recommended for collection on neonates only though it was collected on non-neonatal patients</p> <p>12/1/2011-1/15/2018 data recommended for all age groups and recommended to be collected as worst value.</p> <p>1/15/2018-present Closest to ECLS start AND pre-ECLS.</p>	ECLS.Hemodynamics	MPAP

24-hour ECLS Hemodynamics (continued)

This section details hemodynamic values for a patient closest to 24 hours after the ECLS Start Time. The data must be collected at least 18 hours after the ECLS Start Time and no more than 30 hours after the ECLS Start Time.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/ Modification	Table Name	Column Name / Stored Values
Cardiac Index	<p>This field collects the cardiac index that meets the 24-hour Hemodynamics timing criteria defined above.</p> <p>Enter the lowest Cardiac Index calculated: Cardiac Output / Body Surface Area = L/min/m² or measured.</p>	<p>Units of measure L/min/m² Precision: one decimal point</p> <p>Soft Notification: < 1 L/min/m² or > 10 L/min/m²</p> <p>Hard Limit: < 0 L/min/m² or > 20 L/min/m²</p>	<p>01/01/1998- 12/1/2011 data recommended for collection on neonates only though it was collected on non-neonatal patients</p> <p>12/1/2011-1/15/2018 data recommended for all age groups and recommended to be collected as worst value.</p> <p>1/15/2018-present Closest to ECLS start AND pre-ECLS.</p>	ECLS.Hemodynamics	CI

Blood Pump Flow Rates					
Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/ Modification	Table Name	Column Name / Stored Values
Pump flow at 4hrs (L/min)	<p>This field seeks to collect the ECLS blood flow rates at 4 hours after the ECLS Start Time.</p> <p>Enter the pump flow at 4 hours in L/min. Blood Pump Flow rates should be collected closest to 4 hours after the ECLS Start Time. The data should be collected at least 2 hours after the ECLS Start Time and no more than 6 hours after the ECLS Start Time.</p>	<p>Units of measure L/min Precision: three decimal points</p> <p>Neonate (0-28 days) Soft Notification: < 0.100 L/min or > 0.600 L/min Hard Limit: < 0.050 L/min or > 1.5 L/min mm Hg</p> <p>Pediatric and Adult (> 29 days) Soft Notification: < 0.500 L/min or > 6 L/min Hard Limit: < 0.050 L/min or > 10 L/min</p>	<p>01/01/1998- 12/1/2011 data recommended for collection on neonates only though it was collected on non-neonatal patients</p> <p>12/1/2011-1/15/2018 data recommended for all age groups and recommended to be collected as worst value.</p> <p>1/15/2018-present Closest to ECLS start AND pre-ECLS.</p>	ECLS.Runs	PumpFlow4
Pump flow at 24 hrs (L/min)	<p>This field seeks to collect the ECLS blood flow rates at 24 hours after the ECLS Start Time.</p> <p>Enter the pump flow at 24 hours in L/min. Blood Pump Flow rates should be closest to 4 hours after the ECLS Start Time. The data should be collected at least 22 hours after the ECLS Start Time and no more than 26 hours after the ECLS Start Time.</p>	<p>Units of measure L/min Precision: three decimal points</p> <p>Neonate (0-28 days) Soft Notification: < 0.100 L/min or > 0.600 L/min Hard Limit: < 0.050 L/min or > 1.5 L/min mm Hg</p> <p>Pediatric and Adult (> 29 days) Soft Notification: < 0.500 L/min or > 6 L/min Hard Limit: < 0.050 L/min or > 10 L/min</p>	<p>01/01/1998- 12/1/2011 data recommended for collection on neonates only though it was collected on non-neonatal patients</p> <p>12/1/2011-1/15/2018 data recommended for all age groups and recommended to be collected as worst value.</p> <p>1/15/2018-present Closest to ECLS start AND pre-ECLS.</p>	ECLS.Runs	PumpFlow24

ECLS Care					
Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/ Modification	Table Name	Column Name / Stored Values
Unit where ECLS received	<p>This field is intended to collect the intensive care unit (ICU) where ECLS care was delivered.</p> <p>This is the unit in your hospital where the patient received the majority or most integral aspect of their ECLS care. This variable is added so hospitals can receive ECLS reports clustered by unit. We recommend you give careful consideration to the unit who decided to place the patient on ECLS as patient selection is an important part of ECLS. However, the selection is at the hospital's discretion.</p> <p>Please select one of the following: neonatal, pediatric, pediatric cardiac, adult medicine, adult surgical, adult cardiac, adult cardiovascular, mixed ICU ECLS, emergency department or operating room / catheterization lab.</p>		<p>1/15/2018-present</p> <p>12/12/2018-present Operating Room added with procedural ECLS prompt</p>	ECLS.Runs	<p>PreSuppICU</p> <p>0 = Neonatal 1 = Pediatric 2 = Pediatric Cardiac 3 = Adult Medicine ICU 4 = Adult Surgical ICU 5 = Adult Cardiac ICU 6 = Adult Cardiovascular ICU 7 = Mixed 8 = ECLS 9 = Emergency Department 10 = Operating Room / Cath Lab 11 = Burn ICU</p>

ECLS Care (continued)					
Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/Modification	Table Name	Column Name / Stored Values
Procedural ECLS	<p>If "Operating Room / Cath Lab" is chosen as the Unit Where ECLS Received, you will be prompted to verify or deny if the ECLS was initiated for the primary indication of supporting patient instability during a procedure.</p> <p>Please select Yes if ECLS was initiated and discontinued in the operating room or catheterization lab for the primary indication of supporting patient instability during a procedure.</p> <p>Please select No if ECLS was either initiated or discontinued in the ICU, if the primary ECLS indication was not to provide patient support during a procedure or if the patient was supported by cardiopulmonary bypass.</p> <p>Patient X is cannulated in the hybrid catheterization lab to support gas exchange during scheduled whole lung lavage. The patient is decannulated prior to returning to the ICU. Please enter Operating Room / Cath Lab as the unit where ECLS received and answer Yes to the confirmatory question.</p> <p>Patient Y is cannulated to V-V ECLS in the CVOR to support repair of a tracheal laceration. Due to continued respiratory failure the patient is transported to the Adult Surgical ICU following repair and ultimately decannulated the next day. Please enter Operating Room / Cath Lab as the unit where ECLS received and answer No to the confirmatory question.</p>	<p>Confirmatory question is mandatory only if Operating Room / Cath Lab is selected as the unit where ECLS was received</p>	12/12/2018-present		<p>0 = No 1 = Yes Without Operating Room / Cath Lab="NULL"</p>

ECLS Care (continued)					
Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/ Modification	Table Name	Column Name / Stored Values
Enteral Feeding Date/Time	<p>This field is collects data on enteral (gut) feeding during ECLS</p> <p>This section is relevant if, during ECLS, enteral feeds started and continued for at least 2 days. This does not need to be full enteral nutrition.</p> <p>Patient X was started on ECLS on 11/20/2017. He started enteral nutrition on 11/21/2017, but it was stopped later on 11/21/2017, and then restarted on 11/24/2017 and continued for the next three days. Enter Date/Time Enteral Feeding 11/24/2017.</p> <p>Patient Y was on enteral feeds prior to ECLS and they were not interrupted for the start of ECLS. Enter date of ECLS Start Time.</p>	<p>Hard Limit: Enteral Feeding Date/Time must be AFTER ECLS Start Time.</p> <p>Enteral Feeding Date/Time cannot be earlier than the Date of Birth.</p> <p>Enteral Feeding Date/Time cannot be after the Date of Death.</p>	1/15/2018-present	ECLS.Runs	EnteralFeeding

ECLS Care (Continued)					
Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/Modification	Table Name	Column Name / Stored Values
Level of Mobilization at 7 days	<p>This field collects the level of mobilization for patients 7 days after the ECLS Start Time using the ICU Mobility Scale. Tipping CJ, Bailey MJ, Bellomo R, <i>et al</i>: The ICU Mobility Scale Has Construct and Predictive Validity and Is Responsive. <i>Ann Am Thoracic Soc.</i> 13 (6): 887-93, 2016.</p> <p>This field is only intended for patients who are 8 years old or older. Whether the patient is on ECLS or off ECLS please fill this out 7 days after ECLS Start Time.</p> <p>0 Nothing (lying in bed) Passively rolled or passively exercised by staff, but not actively moving</p> <p>1 Sitting in bed, exercises in bed Any activity in bed, including rolling, bridging, active exercises, cycle ergometry and active assisted exercises; not moving out of bed or over the edge of the bed</p> <p>2 Passively moved to chair (no standing) Hoist, passive lift or slide transfer to the chair, with no standing or sitting on the edge of the bed</p> <p>3 Sitting over edge of bed May be assisted by staff, but involves actively sitting over the side of the bed with some trunk control</p> <p>4 Standing Weight bearing through the feet in the standing position, with or without assistance. This may include use of a standing lifter device or tilt table</p> <p>5 Transferring bed to chair Able to step or shuffle through standing to the chair. This involves actively transferring weight from one leg to another to move to the chair. If the patient has been stood with the assistance of a medical device, they must step to the chair (not included if the patient is wheeled in a standing lifter device)</p> <p>6 Marching on spot (at bedside) Able to walk on the spot by lifting alternate feet (must be able to step at least 4 times, twice on each foot), with or without assistance</p> <p>7 Walking with assistance of 2 or more people Walking away from the bed/chair by at least 5 m (5 yards) assisted by 2 or more people</p> <p>8 Walking with assistance of 1 person Walking away from the bed/chair by at least 5 m (5 yards) assisted by 1 person</p> <p>9 Walking independently with a gait aid Walking away from the bed/chair by at least 5 m (5 yards) with a gait aid, but no assistance from another person. In a wheelchair bound person, this activity level includes wheeling the chair independently 5 m (5 yards) away from the bed/chair</p> <p>10 Walking independently without a gait aid Walking away from the bed/chair by at least 5 m (5 yards) without a gait aid or assistance from another person</p> <p>Patient M was placed on ECMO on 01/01/2017. She came off ECMO on 01/05/2017 and was still intubated. Her mobilization on day 7 was sitting over the edge of the bed. Please enter Level of Mobilization at 7 days = 3.</p>		1/15/2018-present	ECLS.Runs	LevelofMobilization

ECLS Care (Continued)					
Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/ Modification	Table Name	Column Name / Stored Values
Maximum Level of Mobilization during ECLS	<p>This field collects the maximum level of mobilization for ECLS patients achieved while they were on ECLS using the ICU Mobility Scale. Tipping CJ, Bailey MJ, Bellomo R, <i>et al</i>: The ICU Mobility Scale Has Construct and Predictive Validity and Is Responsive. <i>Ann Am Thoracic Soc.</i> 13 (6): 887-93, 2016.</p> <p>This field is only intended for patients who are 8 years old or older. Please use the below scale to record the maximum level of mobilization during ECLS.</p> <p>0 Nothing (lying in bed) Passively rolled or passively exercised by staff, but not actively moving</p> <p>1 Sitting in bed, exercises in bed Any activity in bed, including rolling, bridging, active exercises, cycle ergometry and active assisted exercises; not moving out of bed or over the edge of the bed</p> <p>2 Passively moved to chair (no standing) Hoist, passive lift or slide transfer to the chair, with no standing or sitting on the edge of the bed</p> <p>3 Sitting over edge of bed May be assisted by staff, but involves actively sitting over the side of the bed with some trunk control</p> <p>4 Standing Weight bearing through the feet in the standing position, with or without assistance. This may include use of a standing lifter device or tilt table</p> <p>5 Transferring bed to chair Able to step or shuffle through standing to the chair. This involves actively transferring weight from one leg to another to move to the chair. If the patient has been stood with the assistance of a medical device, they must step to the chair (not included if the patient is wheeled in a standing lifter device)</p> <p>6 Marching on spot (at bedside) Able to walk on the spot by lifting alternate feet (must be able to step at least 4 times, twice on each foot), with or without assistance</p> <p>7 Walking with assistance of 2 or more people Walking away from the bed/chair by at least 5 m (5 yards) assisted by 2 or more people</p> <p>8 Walking with assistance of 1 person Walking away from the bed/chair by at least 5 m (5 yards) assisted by 1 person</p> <p>9 Walking independently with a gait aid Walking away from the bed/chair by at least 5 m (5 yards) with a gait aid, but no assistance from another person. In a wheelchair bound person, this activity level includes wheeling the chair independently 5 m (5 years) away from the bed/chair</p> <p>10 Walking independently without a gait aid Walking away from the bed/chair by at least 5 m (5 yards) without a gait aid or assistance from another person.</p> <p>Patient M was placed on ECMO on 01/01/2017. She came off ECMO on 01/05/2017 and was still intubated. On 01/04/2017 she achieved her maximum ECMO mobilization. She passively moved to chair. Her Maximum Level of Mobilization during ECLS = 2.</p>		1/15/2018-present	ECLS.Runs	MaxLevelofMobilization

6. Modes and Cannulations

In this section please detail the initial ECLS Mode and Cannulas as well as any cannula additions or replacements or mode conversions during the run.

Initial Mode Information

In the Initial Mode, please specify the run start time and stop date/time.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/Modification	Table Name	Column Name / Stored Values
Initial ECLS Mode Start Date/Time	<p>This field collects the ECLS Start Time for a given ECLS Run.</p> <p>If this is the patients Run No 1, then this information is automatically populated from the ECLS start time in the First Run Information. If this is Run No > 1, then you will need to Enter the Date/Time (DD/MM/YYYY HH:MM) ECLS was initiated. This specifically refers to the time that blood flow was established through the ECLS circuit and cannulas.</p> <p>VAD circuits that have an oxygenator: the initial start time of ECLS is the time the oxygenator was added.</p> <p>Patient X required ECLS post-cardiotomy on 02/16/2917 at 09:00AM, Run No 1. He recovered, was sent to the floor and had a cardiac arrest requiring ECPR on 03/15/2017 at 10:00 AM, Run No 2 during the same hospitalization. You are now entering ECLS data for Run No 2. Please enter Initial ECLS Mode Start Date/Time for Run No 2 03/15/2017 10:00 AM.</p>	<p>Hard Limit</p> <p>Time On cannot be earlier than the Date of Birth.</p> <p>Time On cannot be after than the Date of Death.</p>	01/01/1989 - present	ECLS.RunDetails and ECLS.Runs	StartTime and TimeOn

Initial Mode Information (continued)

In the Initial Mode, please specify the run start time, stop date/time and ECLS Mode.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/Modification	Table Name	Column Name / Stored Values
Initial Mode Stop Date/Time	<p>This field collects the ECLS Stop Date/Time for a given ECLS Run.</p> <p>Enter the Date/Time the initial ECLS mode ended. If only one mode occurred then this will also be the ECLS end time. The ECLS end time specifically refers to the time that ECMO flow is stopped for final time during a given run. An ECLS run ends when ECLS cannulas are removed (unless cannulas are left in place to facilitate non-ECLS support such as VAD support) AND ECLS is discontinued for a time period greater than 12 hours.</p> <p>However, when a VAD is in use, cannulas may be left in once the oxygenator is removed. The Initial Mode Stop date/time is the removal of the oxygenator, and that oxygenator removal is for a time period greater than 12 hours.</p> <p>Temporary transition of ECLS Support to cardiopulmonary bypass (CPB) for cardiac surgery would not encompass an additional run. Changes in "ECLS Mode" such as from VA to VV do not constitute a new run in isolation.</p> <p>Patient X required ECPR on 03/15/2017 at 10:00 AM, Run No 2 during the same hospitalization. The ECLS circuit was cut away with cannulas left in on 03/19/2017 at 10:00AM but he went back on ECLS support on 03/19/2017 at 23:00. On 03/21/2017 at 09:00 AM he was again cut away from ECLS with cannulas left in. Cannulas removed the following day 03/22/2017 at 11:00 AM. Initial Mode Stop Date/Time for Run No 2 enter 03/21/2017 at 09:00. When cannulas were left in but support was restarted 13 hours later, this is not considered a new Run (see Run No under Run Information for more details).</p> <p>Patient Y has been supported by RVAD since 10/5/2018. Due to new-onset respiratory failure, an oxygenator was placed in line on 2/12/2019 at 10:30 and removed 2/20/2019 at 22:15. The patient was ultimately removed from all mechanical circulatory support 4/8/2019 during successful heart transplant. ECLS Start Date/Time should be 2/12/2019 10:30 and ECLS Stop Date/Time should be 2/20/2019 22:15</p>	<p>Soft Notification: Time off is not usually after the Date of Death.</p> <p>This run is longer than 30 days. It is okay to have a run longer than 30 days, but please check the ECLS start and stop times.</p> <p>Hard Limit Time Off cannot be earlier than the Date of Birth.</p> <p>Time Off cannot be before Time On.</p> <p>The Time Off must be before any conversion mode Time On</p>	01/01/1989 - present	ECLS.RunDetails ECLS.Runs	EndTime and TimeOff

Mode and Cannulations

This section details the ECLS mode and cannulae associated with this specific Run Detail. You will select “Add New Cannula” for each new cannula placed and “Replace This Cannula” for each cannula replaced (if applicable).

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/Modification	Table Name	Column Name / Stored Values
ECLS Mode	<p>This field defines the mode of drainage and return of blood in the extracorporeal system. This is a required field.</p> <p>Select the primary cannulation configuration even if multiple cannulas are placed.</p> <p>VV: Venovenous support is the application of extracorporeal circulation primarily for respiratory support, in which the extracorporeal circuit drains blood from the venous system and reinfuses into the venous system (or pre-lung). VV ECMO operates in series with the heart and lungs and does not provide bypass of these organs.</p> <p>VA: Venarterial is the application of extracorporeal circulation often for cardiac or circulatory support, in which the extracorporeal circuit drains blood from the venous system and returns into the systemic arterial system. Without qualification, VA ECMO refers to support that returns blood to the systemic arterial system, operating in parallel with and providing partial, or complete, bypass of the heart and lungs.</p> <p>VVA Venovenarterial is a hybrid configuration of VV and VA extracorporeal support in which the extracorporeal circuit drains blood from the venous system and reinfuses into both the venous and systemic arterial systems. VVA ECMO provides both pulmonary (VV component) and cardiac support (VA component) in patients with combined cardiopulmonary failure.</p> <p>VP: Venopulmonary is the application of extracorporeal circulation for combined respiratory and right heart support in which the extracorporeal circuit drains blood from the venous system and reinfuses into the pulmonary artery. VP ECMO provides partial or complete bypass of the right heart but operates in series with the lungs.</p> <p><i>Conrad, S, et al (2018) The Extracorporeal Life Support Organization Maastricht treaty for nomenclature in extracorporeal life support. Am J Respir Crit Care Med, 198(4), 447-451</i></p>		<p>01/01/1989 – present</p> <p>VP Mode 07/12/2020 - present</p>	<p>ECLS.RunDetails (Reporting Notes: 1. We will consider a Run VV à VA if and only if there are two run detail records the first having VV the second having VA. 2. We will consider a Run VA à VV if and only if there are two run detail records the first having VA and the second having VV 3. Any situation having more than 2 run details with different values of Mode will be considered as Support Mode = Other}</p>	<p>Mode</p> <p>(See ECLS.ModeCodes for X-Walk table)</p> <p>1 = VA 2 = VV 3 = VVA 4 = AVCO2R 5 = VVECCO2R 6 = VP 9 = Other</p>

Mode and Cannulations (continued)

This section details the ECLS mode and cannulae associated with this specific Run Detail. You will select “Add New Cannula” for each new cannula placed and “Replace This Cannula” for each cannula replaced (if applicable).

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/Modification	Table Name	Column Name / Stored Values
ECLS Mode (cont'd)	<p><i>Broman LM, et al (2019) The ELSO Maastricht Treaty for ECLS nomenclature: abbreviations for cannulation configuration in extracorporeal life support. A position paper of the Extracorporeal Life Support Organization. Crit Care 23(1), 36. Doi: 10.1186/s13054-019-2334-8.</i></p> <p>AVCO₂R Arteriovenous carbon dioxide removal (AVCO₂R) is the provision of pumpless carbon dioxide exchange through the use of an extracorporeal circuit consisting of an artificial lung, and venous and arterial vascular access cannulas using lower blood flows. Blood flow is driven by the patient’s arterio-venous pressure gradient.</p> <p>VV ECCO₂R Venovenous extracorporeal carbon dioxide removal (VV CO₂R) is the provision of carbon dioxide exchange through the use of an extracorporeal circuit consisting of a blood pump, artificial lung, and venovenous vascular access cannulas using lower blood flows.</p> <p>Other Indicates a support not listed</p> <p>Unknown</p> <p>Patient W, a 10-year old requiring ECMO for respiratory support was placed with a dual-lumen ECMO cannula in the right internal jugular vein, and a second single lumen draining cannula. Choose VV.</p> <p>Patient X, returns from the Cardiovascular Operating Room (CVOR) after scheduled RVAD implantation (right atrium to pulmonary artery). Because the patient’s implantation was complicated by pulmonary hemorrhage, the patient requires an oxygenator to be placed in line with the RVAD circuit. Choose VP.</p>				

Mode and Cannulations (continued)

This section details the ECLS mode and cannulae associated with this specific Run Detail. You will select “Add New Cannula” for each new cannula placed and “Replace This Cannula” for each cannula replaced (if applicable).

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/ Modification	Table Name	Column Name / Stored Values
Percutaneous	<p>This field records if the specific cannula on which you are entering data was placed percutaneously.</p> <p>If the cannula was placed percutaneously (without incision and dissection of the vessel), then select yes from the drop down.</p> <p>Patient Y had a cut down to expose the vessel, then the vessel was accessed with a needle and Seldinger technique was used to place the cannula. Select No from dropdown for Percutaneous.</p>		05/01/1998 - present	ECLS.Cannulations	Percutaneous 0 = No 1 = Yes -1 = Unknown
Pre-Existing	<p>This field records if the cannula on which you are entering detail was pre-existing.</p> <p>Select if this cannula was already present at the beginning of this run.</p> <p>Patient G is converted from VV to VA ECMO. The venous drain cannula is the one that was placed for the first run detail and is still in place for this run detail. The arterial return cannula would be the new cannula placed. Select pre-existing for the venous cannula, but not for the newly placed arterial cannula.</p> <p>Patient Y was transferred to your institution on ECLS. The cannulae were pre-existing.</p>		10/01/2016 - Present	ECLS.Cannulations	Preexisting 0 = No 1 = Yes -1 = Unknown
Manufacturer	<p>This field collects the manufacturer name for a given cannula.</p> <p>Select the manufacturer name from the drop down box. This will generate the specific devices associated with that manufacturer. If the manufacturer and/or device is not listed, please email ELSO at RegistrySupport@elso.org.</p>		09/1993 - present	ECLS.Manufacturers	ManufacturerID, Name
Cannula	<p>This field collects model/name and size of cannula.</p> <p>Every cannula that is connected to the ECLS circuit should be listed. This includes reperfusion cannulas that may direct a small amount of return blood to a distal limb.</p>		09/1993 - present	ECLS.Cannulations	CannulationId (tracked using RunDetailId) This is where initial mode conversion information is stored)

Mode and Cannulations (continued)

This section details the ECLS mode and cannulae associated with this specific Run Detail. You will select “Add New Cannula” for each new cannula placed and “Replace This Cannula” for each cannula replaced (if applicable).

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/ Modification	Table Name	Column Name / Stored Values
Site	<p>This field collects the site where a cannula was placed</p> <p>Select from the drop down box the site in which the cannula was placed. Includes:</p> <p>RCCA – Right Common Carotid Artery LCCA – Left Common Carotid Artery RIJV – Right Internal Jugular Vein RIJVC – Right Internal Jugular Vein Cephalic LIJV – Left Internal Jugular Vein RFA – Right Femoral Artery LFA – Left Femoral Artery RFV – Right Femoral Vein LFV – Left Femoral Vein RA – Right Atrium LA – Left Atrium LV – Left Ventricle LPV – Left Pulmonary Vein PA – Pulmonary Artery Aorta LSA – Left Subclavian Artery LSV – Left Subclavian Vein RSA – Right Subclavian Artery RSV – Right Subclavian Vein RAA – Right Axillary Artery LAA – Left Axillary Artery IA – Innominate RPTA – Right Posterior Tibial Artery LPTA – Left Posterior Tibial Artery RSFA – Right Superficial Femoral Artery LSFA – Left Superficial Femoral Artery Other – Indicates a vessel not listed</p>		<p>01/01/1989 – present</p> <p>10/31/2018 – present RPTA, LPTA, RSFA, LSFA added</p>	ECLS.Cannulations	<p>Siteld</p> <p>0 = Unknown 1 = Aorta 2 = LA 3 = LCCA 4 = LFA 5 = LFV 6 = LIJV 8 = PA 9 = RA 10 = RCCA 11 = RFA 12 = RFV 13 = RIJV 14 = RIJVC 15 = LSA 16 = LSV 17 = RSA 18 = RSV 19 = LPV 20 = LV 21 = RAA 22 = LAA 23 = IA 24 = RPTA 25 = LPTA 26 = RSFA 27 = LSFA 99 = Other</p>

Mode and Cannulations (continued)

This section details the ECLS mode and cannulae associated with this specific Run Detail. You will select “Add New Cannula” for each new cannula placed and “Replace This Cannula” for each cannula replaced (if applicable).

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/ Modification	Table Name	Column Name / Stored Values
Drainage	This field records if the cannula was used to drain blood from the body. Click the box if the cannula was used specifically to drain blood from the patient to the ECLS pump.		10/01/2016 – present	ECLS.Cannulations	Drainage 0 = No 1 = Yes
New Device Start Time	This field collects the start date and time for each cannula use.		01/13/2020 - present	ECLS.Cannulations	StartTime
New Device End Time	This field collects the end date and time for each cannula use	Soft Notification: Cannulation Start Time is not usually before run Time On or after Run Time Off. Selecting the checkbox, if applicable, avoids redundancy of data entry.	01/13/2020 - present	ECLS.Cannulations	EndTime
Cannula(s) Used for Entire ECLS Mode and Run	If the start and end times of the new cannula are the same as the time on and time off ECLS for that ECLS mode and run, select the appropriate checkbox.	Selecting the checkbox, if applicable, avoids redundancy of data entry.	01/13/2020 - present	ECLS.Cannulations	StartEndAsRun 0 = NULL 1 = Checkbox selected

Mode and Cannulations (continued)

This section details the ECLS mode and cannulae associated with this specific Run Detail. You will select “Add New Cannula” for each new cannula placed and “Replace This Cannula” for each cannula replaced (if applicable).

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/Modification	Table Name	Column Name / Stored Values
Device Replacement Reason	<p>This field collects the primary reason for cannula replacement, if applicable.</p> <p>Select from the drop-down box the primary reason for cannula replacement (removal of old cannula and addition of new cannula):</p> <p>Thrombosis: Cannula exchanged primarily due to clot burden within the cannula</p> <p>Hemolysis: Cannula exchange primarily indicated by center-specific markers of hemolysis (for example, plasma free hemoglobin, lactate dehydrogenase, haptoglobin or bilirubin) believed to be related to cannula selection or position</p> <p>Cannula(s) removed for attempted ECLS separation: Cannulas removed for expected recovery or trial separation (with new cannulas replaced within 12 hours during the same ECLS run)</p> <p>Change in cannulation strategy: Cannulas exchanged due to change in cannulation site(s) during a single ECLS run and mode (for example, change from thoracic to neck cannulation during a V-A ECLS run)</p> <p>Structural integrity: cannula exchanged for impaired structural integrity</p> <p>Other</p>		01/13/2020 - present	ECLS.Cannulations	ReplaceReasonId Lookup Table: ECLS.CannulaReplacement Codes 1 = Thrombosis, 2 = Hemolysis, 3 = Cannula(s) removed for attempted ECLS separation, 4 = Change in cannulation strategy, 5 = Structural integrity 6 = Other

Mode Conversion

Some patients will have multiple 'Conversions' during a given Run. A new 'Conversion' is required when and only when there is a change from one mode to another mode within a single ECLS run. In the **Conversion** section you can document the addition or removal of ECLS cannulas. Temporary transition of ECLS Support to cardiopulmonary bypass (CPB) for cardiac surgery would not encompass an additional run or new run detail unless there was a conversion in the ECLS mode.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/ Modification	Table Name	Column Name / Stored Values
Conversion Mode Start Date/Time	Enter the Date/Time ECLS mode was initiated. This specifically refers to the time that blood flow was established through the newly placed cannulas.	<p>Hard Limit</p> <p>Conversion Start Date/Time cannot be BEFORE the Date of Birth.</p> <p>Conversion Start Date/Time cannot be BEFORE Time On.</p> <p>Conversion Start Date/Time cannot be BEFORE the Initial Mode Stop Date/Time.</p> <p>Conversion Start Date/Time cannot be more than 12 hours after the previous Mode Stop Time</p> <p>Conversion Start Date/Time cannot be before Initial or Previous Mode Stop Time.</p>	<p>01/01/1989 – 10/01/2016 as a check box for VV to VA.</p> <p>Specific date/time of conversion collected as a run detail 01/20/2017</p> <p>10/01/2016-01/20/2017 collected as 'other'</p>	<p>ECLS.RunDetails</p> <p>And</p> <p>ECLS.Runs</p>	<p>StartTime in ECLS.RunDetails table</p>

Mode Conversion (continued)

Some patients will have multiple 'Conversions' during a given Run. A new 'Conversion' is required when and only when there is a change from one mode to another mode within a single ECLS run. In the **Conversion** section you can document the addition or removal of ECLS cannulas. Temporary transition of ECLS Support to cardiopulmonary bypass (CPB) for cardiac surgery would not encompass an additional run or new run detail unless there was a conversion in the ECLS mode.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/ Modification	Table Name	Column Name / Stored Values
Conversion Mode Stop Date/Time	Enter the Date/Time the ECLS mode ended. If this is the final mode then it will also be the ECLS end time. The ECLS end time specifically refers to the time that the cannulas are removed (unless cannulas are left in place to facilitate non-ECLS support such as VAD support). The final ECLS stop time may also refer to the date/time a patient was transported out of your institution on ECLS.	<p>Soft Notification: Stop Date/Time is not usually after the Date of Death.</p> <p>Hard Limit Stop Date/Time cannot be earlier than the Date of Birth.</p> <p>Stop Date/Time cannot be before Time On.</p>	<p>01/01/1989 – 10/01/2016 as a check box for VV to VA.</p> <p>Specific date/time of conversion collected as a run detail 01/20/2017</p> <p>10/01/2016-01/20/2017 collected as 'other'</p>	<p>ECLS.RunDetails</p> <p>ECLS.Runs</p>	<p>EndTime</p> <p>TimeOff</p>

Mode Conversion (continued)

Some patients will have multiple 'Conversions' during a given Run. A new 'Conversion' is required when and only when there is a change from one mode to another mode within a single ECLS run. In the **Conversion** section you can document the addition or removal of ECLS cannulas. Temporary transition of ECLS Support to cardiopulmonary bypass (CPB) for cardiac surgery would not encompass an additional run or new run detail unless there was a conversion in the ECLS mode.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/ Modification	Table Name	Column Name / Stored Values
Conversion Mode	For a new conversion you must enter a new ECLS mode. It cannot be the same as the immediately previous mode or it is not a conversion. Please select V-V, V-A, V-VA, A-VCO2R, V-V ECCO2R, VP as described in ECLS Mode in First Run Information .	Hard Limit Conversion Mode will NOT allow 2 of the same modes in a row	01/01/1989 – 10/01/2016 as a check box for VV to VA. Specific date/time of conversion collected as a run detail 01/20/2017 10/01/2016-01/20/2017 collected as 'other'	ECLS.RunDetails (Reporting Notes: 1. We will consider a Run VV à VA if and only if there are two run detail records the first having VV the second having VA. 2. We will consider a Run VA à VV if and only if there are two run detail records the first having VA and the second having VV 3. Any situation having more than 2 run details with different values of Mode will be considered as Support Mode = Other }	Mode (See ECLS.ModeCodes for X-Walk table) 1 = V-A 2 = V-V 3 = V-VA 4 = A-VCO2R 5 = V-VECCO2R 6 = VP 0 = Unknown 9 = Other

7. EQUIPMENT

This section details the equipment the patient was on during the ECMO Run.

Membrane Lung

Please specify details regarding membrane lung use, including membrane lung replacements or additions

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/ Modification	Table Name	Column Name / Stored Values
Membrane Lung	<p>This field collects the type of membrane lung a patient has. A membrane lung is a gas exchange device for transfer of oxygen and carbon dioxide by diffusion across a membrane between a blood phase and a gas phase.</p> <p>Select from the drop-down box the manufacturer. This will generate the specific devices associated with that manufacturer. If the manufacturer and/or device is not listed, please email ELSO at RegistrySupport@elso.org.</p>		01/01/1989 - present	ECLS.Equipments Lookup Table: ECLS.Membrane Lungs	MembraneLungId and Name
Replace existing Membrane Lung	Selecting this field denotes that the existing Membrane Lung was replaced with a new Membrane Lung, please enter new membrane lung details.		01/13/2020 - present	ECLS.Equipment History	AddedReplaced
Add additional concurrent Membrane Lung	This selection denotes that MORE THAN ONE Membrane Lung are used concurrently. If additional membrane lung(s) are added to the ECLS circuit for concurrent use, please enter details of additional membrane lung(s) added.		01/13/2020 - present	ECLS.Equipment History	DeviceId
New Device Start Time	This field collects the start date and time for each membrane lung used.		01/13/2020 - present	ECLS.Equipment History	StartTime
New Device End Time	This field collects the end date and time for each membrane lung used.		01/13/2020 - present	ECLS.Equipment History	EndTime

Membrane Lung (continued)

Please specify details regarding membrane lung use and replacement

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/ Modification	Table Name	Column Name / Stored Values
Device Replacement Reason	<p>This field collects the primary reason for membrane lung replacement, if applicable.</p> <p>Select from the drop-down box the primary reason for membrane lung replacement (removal of old membrane lung and addition of new membrane lung):</p> <p>Structural integrity: Membrane lung exchanged for suspected impaired structural integrity such as suspected plasma or blood leak, etc.</p> <p>Decreased efficiency of gas exchange: Membrane lung exchanged for the primary reason of compromised oxygenation and/or ventilation. This is typically a consequence of clot burden over time.</p> <p>Acute obstruction to blood flow: Membrane lung exchanged in response to a sudden loss or clinically significant decrease in blood flow resulting in emergent equipment exchange.</p> <p>Increasing resistance to blood flow: Membrane lung exchanged in response to increasing trans-membrane pressures or decreasing blood flow of over time.</p> <p>Coagulopathy with membrane lung as known source: Device exchange primarily indicated by clot burden or coagulation derangement within the membrane lung.</p> <p>Hemolysis with membrane lung as known source: Device exchange primarily indicated by center-specific markers of hemolysis (for example, plasma free hemoglobin, lactate dehydrogenase, haptoglobin or bilirubin) believed to be related to the membrane lung.</p> <p>Entire circuit replaced due to hemolysis of unknown source: The entire circuit was exchanged due to center-specific markers of hemolysis (for example, plasma free hemoglobin, lactate dehydrogenase, haptoglobin or bilirubin) of unspecified source.</p> <p>Entire circuit replaced due to coagulopathy of unknown source: The entire circuit was exchanged due to clot burden or coagulation derangement of unspecified source.</p>	<p>Mandatory field only if membrane lung was replaced during the run</p> <p>12/01/2021-present If structural integrity, decreased efficiency of gas exchange, increasing resistance to blood flow or obstruction to blood flow are selected as the reason for membrane lung exchange, a complication of oxygenator failure must be entered within 4 hours of the equipment exchange if ECMO Stop Date/Time or Date/Time of Death is not within 4 hours</p> <p>If equipment longevity / center protocol, entire circuit replaced due to indicated component change, transition to bypass, entire circuit replaced due to hemolysis of unknown source or entire circuit replaced due to coagulopathy of unknown source, a membrane lung failure associated with this equipment exchange must</p>	<p>01/13/2020 – present 10/17/2021 – present Additional validation added requiring complication to be present if the reason for equipment exchange is indicative of equipment failure.</p>	ECLS.Equipment History	<p>ReplaceReasonId</p> <p>Lookup table: ECLS. MembraneLungReplacementCodes</p> <p>1 = Structural integrity, 2 = Decreased efficiency of gas exchange, 3=Acute obstruction to blood flow, 4=Increasing resistance to blood flow 5 = Coagulopathy with membrane lung as known source, 6 = Hemolysis with membrane lung as known source, 7 = Equipment longevity / center protocol 8 = Entire circuit replaced due to indicated component(s) change 9 = Entire circuit replaced following temporary transition to bypass 10 = Entire circuit replaced due to</p>

	<p>Equipment longevity / center protocol: Device exchange indicated by center-specific protocol regarding longevity of use without evidence of other derangement. May be due to transition to or from a transport ECLS circuit.</p> <p>Entire circuit replaced due to indicated component(s) change: Device was exchanged as part of whole circuit exchange primarily for an indication specific to a circuit component other than the membrane lung</p> <p>Entire circuit replaced following temporary transition to bypass: Device exchanged during whole circuit exchange following temporary transition of patient mechanical support o cardiopulmonary bypass within a continuous ECLS run</p> <p>Other</p>	not be entered			<p>hemolysis of unknown source</p> <p>11 = Entire circuit replaced due to coagulopathy of unknown source</p> <p>12 = Other</p>
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Blood Pump					
Please specify details regarding blood pump use, including blood pump replacements or additions					
Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/ Modification	Table Name	Column Name / Stored Values
Blood Pump	<p>The blood pump is a mechanical device, typically powered by an electric drive motor, that produces blood flow by creating a hydrodynamic pressure gradient between an inlet and outlet port.</p> <p>Select from the drop-down box the manufacturer. This will generate the specific devices associated with that manufacturer. If the manufacturer and/or device is not listed, please email ELSO at RegistrySupport@elso.org.</p>		01/01/1989 - present	ECLS.Equipments Lookup Table: ECLS.Pumps	PumpId and Name
Replace existing Blood Pump	Selecting this field denotes that the existing Blood Pump was replaced with a new Blood Pump, please enter new membrane lung details..		01/13/2020 - present	ECLS.Equipment History	AddedReplaced

Blood Pump (continued)

Please specify details regarding blood pump use, including blood pump replacements or additions

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/Modification	Table Name	Column Name / Stored Values
Add additional concurrent Blood Pump	This selection denotes that MORE THAN ONE Blood Pump are used concurrently. Blood Pump(s) are added to the ECLS circuit for concurrent use, please enter details of additional membrane lung(s) added.		01/13/2020 - present	ECLS.Equipment History	DeviceId
New Device Start Time	This field collects the start date and time for each membrane lung used.		01/13/2020 - present	ECLS.Equipment History	StartTime
New Device End Time	This field collects the end date and time for each membrane lung used.		01/13/2020 - present	ECLS.Equipment History	EndTime
Device Replacement Reason	<p>This field collects the primary reason for blood pump replacement, if applicable.</p> <p>Select from the drop-down box the primary reason for blood pump replacement (removal of old blood pump and addition of new blood pump):</p> <p>Mechanical replacement: Blood pump replaced for failure or presumed failure of normal mechanical operation</p> <p>Obstruction to blood flow: Device exchange primarily indicated by clot burden within the blood pump resulting in clinically significant decrease in blood flow.</p> <p>Hemolysis with blood pump as known source: Device exchange primarily indicated by center-specific markers of hemolysis (for example, plasma free hemoglobin, lactate dehydrogenase,</p>	<p>Mandatory field only if membrane lung was replaced during the run</p> <p>12/01/2021 – present</p> <p>If mechanical replacement was selected, a blood pump failure complication must be entered</p>	<p>01/13/2020 – present</p> <p>11/04/2021 - present</p>	ECLS.Equipment History	<p>ReplaceReasonId</p> <p>Lookup table: ECLS. BloodPumpReplacementCodes</p> <p>1 = Mechanical replacement 2 = Obstruction to blood flow 3 = Hemolysis with blood pump as known source</p>

	<p>haptoglobin or bilirubin) believed to be related to the blood pump.</p> <p>Equipment longevity / center protocol: Device exchange indicated by center-specific protocol regarding longevity of use without evidence of other derangement. May be due to transition to or from a transport ECLS circuit.</p> <p>Entire circuit replaced due to indicated component(s) change: Device was exchanged as part of whole circuit exchange primarily for an indication specific to a circuit component other than the blood pump</p> <p>Entire circuit replaced due to hemolysis of unknown source: The entire circuit was exchanged due to center-specific markers of hemolysis (for example, plasma free hemoglobin, lactate dehydrogenase, haptoglobin or bilirubin) of unspecified source.</p> <p>Entire circuit replaced due to coagulopathy of unknown source: The entire circuit was exchanged due to clot burden or coagulation derangement of unspecified source.</p> <p>Entire circuit replaced following temporary transition to bypass: Device exchanged during whole circuit exchange following temporary transition of patient mechanical support o cardiopulmonary bypass within a continuous ECLS run</p> <p>Other</p>				<p>4 = Equipment longevity / center protocol</p> <p>5 = Entire circuit replaced due to indicated component(s) change</p> <p>6 = Entire circuit replaced following temporary transition to bypass</p> <p>7 = Other</p> <p>8 = Entire circuit replaced due to hemolysis of unknown source</p> <p>9 = Entire circuit replaced due to coagulopathy of unknown source</p>
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Heat Exchanger					
Please specify details regarding the heat exchanger the patient was on for the majority of the ECMO Run					
Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/Modification	Table Name	Column Name / Stored Values
Heat Exchanger	<p>The heat exchanger is a device which transfers heat between a recirculating water phase and the blood phase of the ECLS circuit. The heat exchanging material is usually metal or plastic. Modern artificial membrane lungs have heat exchangers integrated into their design.</p> <p>Select from the drop-down box the manufacturer. This will generate the specific devices associated with that manufacturer. If the manufacturer and/or device is not listed, please email ELSO at RegistrySupport@elso.org.</p>		<p>01/01/1989 – 10/15/2020</p> <p>Equipment category was retired 10/15/2020 with preservation of historical data.</p>	<p>ECLS.Equipments</p> <p>Lookup Table: ECLS.HeatExchangers</p>	HeatExchangerId and Name

Temperature Regulation

Please specify details regarding the temperature regulation device the patient was on for the majority of the ECMO Run

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/ Modification	Table Name	Column Name / Stored Values
Temperature Regulation	<p>The temperature regulation device is device that pumps temperature-controlled water to the heat exchanger via lines connecting the heat exchanger and the Temperature Regulation unit. It is often referred to as a recirculating water bath. Setting the temperature in this unit ultimately controls the patient's blood and systemic temperature.</p> <p>Select from the drop-down box the manufacturer. This will generate the specific devices associated with that manufacturer. If the manufacturer and/or device is not listed, please email ELSO at RegistrySupport@elso.org.</p>		01/01/1989 - present	<p>ECLS.Equipments</p> <p>Lookup Table: ECLS.TemperatureRegulations</p>	TemperatureRegulation Id and Name

Hemofilter

Please specify details regarding the hemofilter the patient was on for the majority of the ECMO Run

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/ Modification	Table Name	Column Name / Stored Values
Hemofilter	<p>Select from the drop-down box the manufacturer.</p> <p>This will generate the specific devices associated with that manufacturer. If the manufacturer and/or device is not listed, please email ELSO at RegistrySupport@elso.org.</p>		01/01/1989 - present	<p>ECLS.Equipments</p> <p>Lookup Table: ECLS.Hemofilters</p>	HemofilterId and Name

8. DIAGNOSES

This section details the diagnoses associated with the patient placed on ECLS. Diagnoses are listed as ICD-10 codes. Starting entry of the first 3 characters of the code will auto populate the codes, allowing you to select the exact code required. There is no limit to the diagnoses you may enter. Typically, diagnosis that are pertinent to the specific admission for ECLS are entered. Chronic conditions may also be included. Diagnoses after ECLS may also be added, including those associated with discharge and/or death.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/Modification	Table Name	Column Name / Stored Values
Primary Diagnosis	<p>Click box to note the primary diagnosis for why the patient was placed on ECLS.</p> <p>For example, if a Patient X was a previously healthy person admitted to the ICU with pneumonia and secondary acute respiratory distress syndrome, the diagnosis for which ECLS was needed would be pneumonia.</p> <p>If Patient Y had biventricular congestive heart failure and developed a pneumonia that exacerbated his heart failure leading to cardiac ECLS support for acute on chronic respiratory failure, then the primary diagnosis would be acute on chronic respiratory failure with a secondary diagnosis of pneumonia.</p> <p>If Patient Z had AML and developed adenoviral pneumonia as a result, leading to a need for respiratory ECMO, then the primary diagnosis would be pneumonia with AML as a secondary diagnosis.</p> <p>The difference in case Y and Z is the reason for ECMO; in Patient Y, the patient required ECMO support because of their cardiac failure not pneumonia whereas in Patient Z, ECLS was required because of pneumonia though they may have acquired pneumonia due to a pre-existing condition.</p>		01/01/1989-present On 09/15/2016 It changed from ICD 9 to ICD 10	ECLS.Diagnoses	PrimaryDiagnosis 0 = No 1 = Yes
Diagnoses	Select 'Add new diagnosis' for each code to enter. Multiple diagnoses may be added as necessary.	Enter valid ICD 10 code	01/01/1989-present On 09/15/2016 It changed from ICD 9 to ICD 10	ECLS.Diagnoses	DiagnosisId

9. CPT PROCEDURE CODES

This section details the procedures associated with the patient placed on ECLS. Procedures are listed as CPT codes. Starting entry of the first 3 characters of the code will auto populate the codes, allowing you to select the exact code required. There is no limit to the procedures you may enter. Typically, procedures that are pertinent to the specific admission for ECLS are entered. Procedures that occur immediately prior to ECLS may be included, if the Center determines they are pertinent to the ECLS run. *However, procedures and testing that are common to all ICU patients, such as arterial line placement are not required.* Procedures performed after ECLS may also be added, including those associated with discharge and/or death.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/ Modification	Table Name	Column Name / Stored Values
Date/ Time	Enter the Date/Time for the procedure. This will determine if the procedure was pre-ECLS, on-ECLS, or post-ECLS. Date may not be after the date of death.	<p>Soft Notification: CPT Date/Time is not usually earlier than the Date of Birth.</p> <p>CPT Date/Time is not usually more than 24 hours prior to Time on ECLS or 24 hours after Time Off ECLS</p> <p>Hard Limit CPT Date/Time cannot be AFTER the time of Death</p> <p>CPT Date/Time cannot be more than 30 days prior to Time on ECLS or 30 days after Time Off ECLS</p>	<p>09/15/2016 - present</p> <p>01/15/2020 - present: Date/Time soft notification of 24 hours removed from ECLS and hard limit of 30 days removed from ECLS added.</p>	ECLS.Procedures	Date
Estimated	<p>This field collects if the Date/Time of the procedure cannot be known exactly and thus represents best estimation of the complication. Select Yes or No.</p> <p>Check the box if the Date/Time is estimated.</p>		09/15/2016-present	ECLS.Procedures	<p>DateEstimated</p> <p>1 = Yes 2 = No</p>
Code	Select 'Add new procedure' for each code to enter.	Enter Valid CPT	02/01/1998-present	ECLS.Procedures	CPTCode

10.ECLS COMPLICATIONS

This section details complications that arise during critical illness supported by ECLS. Every complication has 3 fields that are associated with it. A Complication Date/Time, a check box to indicate if the Complication Date/Time is Estimated, and a drop-down box to select the Complication type. The same Complication type can be entered multiple times by selecting different Complication Date/Times for the same Complication type.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/ Modification	Table Name	Column Name / Stored Values
ECLS Complications	This field identifies if this run has any complications	<p>Yes or No response mandatory for category</p> <p>Complication Date/Time may be entered, if known.</p> <p>Hard Limit: ECLS Complication Date/Time may not be more than 14 days after ECLS Stop Date/Time</p>	<p>07/2018 - present</p> <p>04/03/2021- present</p>		
Date/ Time	<p>Enter the Date/Time for the ECLS complication. This will determine when during the ECLS Run the complication occurred.</p> <p>ECLS complications are intended to collect data on complications that occur during an ECLS run. If a complication occurred to the placing a patient on ECLS and but it occurred before the ECLS Start Time this would still be an ECLS complication. If a complication was recognized after ECLS, and you are confident it was a complication of the ECLS run it is appropriate to mark an estimated time after the ECLS Stop Time.</p> <p>Patient Z had a laceration of his right femoral artery requiring 3 units of blood transfusion at 03/11/2017 at 10:00 AM. ECLS start time was 10:15 AM during cannulation. Enter Complication Date/Time 03/11/2017 10:00 AM. Choose complication peripheral cannula site (see below for description of complications)</p>	<p>Soft Notification: ECLS Complication Date/Time is not usually earlier than ECLS Start Time. ECLS Complication Date/Time is not usually later than ECLS Stop Time.</p> <p>Hard Limit: ECLS Complication Date/Time cannot be earlier than the Date of Birth.</p> <p>Complication Date/Time cannot be AFTER the time of Death</p>	<p>09/15/2016- present</p> <p>04/21/2022 – present Changed complication cannot to after Run time off – and added complication cannot be after 14 days Run time off</p>	ECLS.Complications	Time

	<p>Patient Y had stroke recognized on magnetic resonance imaging (MRI) on 03/18/2017 at 12:00 PM. ECLS Stop Time was 03/16/2017 at 09:00 PM. If you know when it occurred because of a clinical correlate in time, enter that date and time. Otherwise, it is acceptable to enter Complication Date/Time 03/18/2017 at 12:00 PM and check estimated. Complication would be CNS Infarction (US or CT or MRI)</p>	<p>(if not verified)</p> <p>Complication Date cannot be more than 14 days after Run Time Off</p> <p>Complication Time cannot be more than 4 hours prior to ECLS Time On</p> <p>The same complication is not allowed to be entered more than once at the same date/time.</p>			
Estimated	<p>This field collects if the Date/Time of the complication cannot be known exactly and thus represents best estimation of the complication. Select Yes or No.</p> <p>Check the box if the Date/Time is estimated.</p>		09/16/2016-present	ECLS.Complications	<p>Estimated</p> <p>0 = No</p> <p>1 = Yes</p>

Mechanical Complications

Mechanical complications are defined as those requiring intervention, such as change of equipment or circuit components. For example: a clot present in the circuit that does not require intervention such as a component change would not be listed. These complications are listed in drop down under the field name complications. For each complication please enter Date/Time and indicate if the Date/Time is Estimated. If you are not sure of the exact time for the procedure, please select Estimated.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/Modification	Table Name	Column Name / Stored Values
Membrane lung failure	Change indicated due to clot formation, gas exchange failure or blood leak	Soft Notification: If membrane lung failure is selected, a membrane lung exchange should be entered in most circumstances	01/01/1989 - present	ECLS.ComplicationCodes	Code 101
Blood pump failure	Change indicated due to equipment failure	Soft Notification: If blood pump failure is selected, a blood pump exchange should be entered in most circumstances	01/01/1989 - present	ECLS.ComplicationCodes	Code 104
Raceway rupture	In a roller pump rupture of the raceway tubing		01/01/1989 - present	ECLS.ComplicationCodes	Code 102
Other tubing rupture	Rupture of ECLS tubing		01/01/1989 - present	ECLS.ComplicationCodes	Code 103
Circuit change	Entire circuit (with exception of cannulae) changed due to clot formation or mechanical failure	Hard Limit If circuit change is selected, equipment exchanges must also be entered for both the membrane lung and blood pump	01/25/2018 - present	ECLS.ComplicationCodes	Code 132
Cannula problems	Requiring intervention (reposition or exchange) for misplacement, dislodgement, replacement due to clots/fibrin, mechanical failure or inappropriate position		01/01/1989 - present	ECLS.ComplicationCodes	Code 131
Temperature Regulation Device Malfunction	Malfunction of temperature regulation device leading to unintentional hypothermia <35C or hyperthermia >39		01/01/1989 - present	ECLS.ComplicationCodes	Code 105

Clots and Air Emboli	If a clot or an air embolus causes a mechanical failure or change out of a circuit component please indicate the complication below.		-01/25/2018 - present	ECLS.ComplicationCodes	Code 133
Thrombosis/Clots: circuit component	Circuit component (e.g. pigtails, connectors, bridge, arterial or venous tubing) requiring change due to clot formation or mechanical failure of the component, not equipment.		01/25/2018 - present	ECLS.ComplicationCodes	Code 134
Clots Hemofilter	Clots in hemofilter causing hemofilter to need to be changed or to fail		-07/01/1997 - present	ECLS.ComplicationCodes	Code 114
Air in circuit	Requiring circuit intervention or circuit clamping for bubble detector alarm, visualized air, air entry into patient		07/01/1997 - present	ECLS.ComplicationCodes	Code 121

Patient Complications

Patient complications are generally defined by their need for intervention, but specific definitions are provided for each Patient Complication below. Complications are those associated with the ECLS run or as a consequence of ECLS. These complications are listed in drop down under the field name complications. For each complication please enter Date/Time and indicate if the Date/Time is Estimated. If you are not sure of the exact time for the procedure, please select Estimated. Major Complications are highlighted in yellow. There are different types of patient complications, broadly: Hemorrhage, Neurologic, Renal, Cardiovascular, Pulmonary, Metabolic, and Organ Limb Ischemia

Patient Hemorrhagic Complications

Hemorrhagic complications requiring packed red blood cell or whole blood (PRBC) transfusion (>20ml/kg/calendar day of PRBCs or >3U PRBCs/calendar day in neonates and pediatrics and >3U PRBCs/calendar day in adults) or other intervention such as surgical or endoscopic intervention.

A calendar day is chosen over a 24-hour period because 24 hours could stop or start at any time and increase the likelihood of an error in data entry. (Mitchell LG, Goldenberg NA, Male C, et al; Perinatal and Paediatric Haemostasis Subcommittee of the SSC of the ISTH: Definition of clinical efficacy and safety outcomes for clinical trials in deep venous thrombosis and pulmonary embolism in children. *J Thromb Haemost* 2011; 9:1856–1858).

Examples:

Patient X is a 4.00 kg 20-day-old who suffered neck cannula site bleeding that required surgical intervention to address the bleeding on 03/11/2017. This is a hemorrhagic complication of the peripheral cannula site.

Patient Y is 55.0 kg 15-year-old who received 3 units (960 mL of PRBC or 17.5mL/kg) on 03/11/2017 for blood recovered from the nasogastric tube. This is a hemorrhagic complication of GI hemorrhage.

Patient Z is 60-year-old 40 kg woman who received 2 units of PRBC transfusion on 03/11/2017 between 8:00PM and 11:39 PM and 1 unit of PRBC on 03/12/2017 between 12:01AM and 2:00AM. This is not a hemorrhagic complication because it was less than 3 units of PRBC in a calendar day in an adult.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/ Modification	Table Name	Column Name / Stored Values
GI hemorrhage	Upper or lower GI hemorrhage requiring PRBC transfusion (>20ml/kg/24 hrs of PRBCs or \geq 3U PRBCs/24 hrs in neonates and pediatrics or \geq 3U PRBCs/24 hrs in adults), and/or, endoscopic intervention, and/or hemostatic agent deployment		07/01/1997 — 1/25/2018 1/25/2018 – Present Specific amounts of blood loss added.	ECLS.ComplicationCodes	Code 201

Patient Hemorrhagic Complications (continued)

Patient complications are generally defined by their need for intervention, but specific definitions are provided for each Patient Complication below. These complications are listed in drop down under the field name complications. For each complication please enter Date/Time and indicate if the Date/Time is Estimated. If you are not sure of the exact time for the procedure, please select Estimated. Major Complications are highlighted in yellow. There are different types of patient complications, broadly: Hemorrhage, Neurologic, Renal, Cardiovascular, Pulmonary, Metabolic, and Organ Limb Ischemia.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/ Modification	Table Name	Column Name / Stored Values
Peripheral cannulation site bleeding	Select this complication if there is bleeding from a peripheral cannulation site such as the neck, groin, or axilla. Peripheral cannulation site bleeding requiring PRBC transfusion (>20ml/kg/24 hrs of PRBCs or $\geq 3U$ PRBCs/24 hrs in neonates and pediatrics or $\geq 3U$ PRBCs/24 hrs in adults) and/or, surgical intervention (includes intravascular hemostatic agent deployment). A reperfusion cannula is a type of peripheral cannulation site.		01/25/2018 - present 1/25/2018 – Present Specific amounts of blood loss added.	ECLS.ComplicationCodes	Code 222
Mediastinal cannulation site bleeding	Select this complication if there is bleeding from cannulae that are placed across the mediastinum. Mediastinal cannulations are also referred to as central cannulations and are placed via their mediastinum. Mediastinal cannulation site bleeding requiring PRBC transfusion (>20ml/kg/24 hrs of PRBCs or $\geq 3U$ PRBCs/24 hrs in neonates and pediatrics or $\geq 3U$ PRBCs/24 hrs in adults, and/or surgical intervention.		01/25/2018 - present 1/25/2018 – Present Specific amounts of blood loss added.	ECLS.ComplicationCodes	Code 223
Surgical site bleeding	Select this complication if there is bleeding from a surgical site other than mediastinal or peripheral cannulation site. Requiring PRBC transfusion (>20ml/kg/24 hrs of PRBCs or $\geq 3U$ PRBCs/24 hrs in neonates and pediatrics or $\geq 3U$ PRBCs/24 hrs in adults), and/or surgical intervention		07/01/1997 – 1/25/2018 1/25/2018 – Present Specific amounts of blood loss added.	ECLS.ComplicationCodes	Code 203

Patient Neurologic Complications

Patient complications are generally defined by their need for intervention, but specific definitions are provided for each Patient Complication below. These complications are listed in drop down under the field name complications. For each complication please enter Date/Time and indicate if the Date/Time is Estimated. If you are not sure of the exact time for the procedure, please select Estimated. Major Complications are highlighted in yellow.

Patient Neurologic Complications are central nervous system accidents including brain death, seizures, ischemia, infarcts, and hemorrhage.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/ Modification	Table Name	Column Name / Stored Values
Brain death	<p>Select this complication if a patient suffered brain death or neurological determination of death.</p> <p>Brain Death The Canadian Neurocritical Care Guideline defined brain death as the irreversible loss of the capacity for consciousness combined with the irreversible loss of all brainstem functions, including the capacity to breathe. Brain death is equivalent to death of the individual, even though the heart continues to beat and spinal cord functions may persist <i>Canadian Neurocritical Care Group. Guidelines for the diagnosis of brain death. Can J Neurol Sci 1999;26(1):64-6.</i> A detailed description of establishing brain death for adults can be found at this citation <i>American Academy of N Evidence-based guideline update: determining brain death in adults: report of the Quality Standards Subcommittee of the American Academy of Neurology. Neurology. 2010;74(23):1911-8.</i></p> <p>Neurological determination of death (NDD) is the process and procedure for determining brain death. The Canadian medical standard for NDD is reported in and is described for children. <i>Shemie SD, et al., Pediatric Reference G, Neonatal Reference G. Severe brain injury to neurological determination of death: Canadian forum recommendations. CMAJ. 2006;174(6):S1-13.</i></p> <p>Ancillary Tests: The demonstration of the absence of intracerebral blood flow is considered the standard as an ancillary test for brain death. Currently validated imaging techniques are cerebral angiography (1) and radionuclide angiography (2). (1) <i>Wilkening M,, et al. Validity of cerebral angiography via ve- nous route in the diagnosis of brain death. Bull Acad Natl Med 1995;179(1):41-8. French.</i> (2) <i>Wieler H, et al. Tc-99m HMPAO cerebral scitigraphy. A reli- able, noninvasive method for determination of brain death. Clin Nucl Med 1993;18(2):104-9.</i></p> <p>Apnea Test on ECMO: The patient should be placed on continuous positive airway pressure (CPAP) while the sweep gas flow rate is set to a maximum of 1.0 liter/minute. If the PaCO₂ does not rise above 60 mmHg or change by 20 mmHg, the sweep flow can be incrementally lowered to as low as 0.1 liter/minute while still maintaining adequate oxygenation in most circumstances. <i>Giani M, et al (2016) Apnea test during brain death assessment in mechanically ventilated and ECMO patients. Intensive Care Med 42:72-81.</i></p>	This complication must be selected for those patients whom meet brain death criteria in order to enter a date/time of death before time off ECMO.	07/01/1997 – 1/25/2018 1/25/2018 - present Specific definitions added.	ECLS.ComplicationCodes	Code 301

Patient Neurologic Complications

Patient complications are generally defined by their need for intervention, but specific definitions are provided for each Patient Complication below. These complications are listed in drop down under the field name complications. For each complication please enter Date/Time and indicate if the Date/Time is Estimated. If you are not sure of the exact time for the procedure, please select Estimated. Major Complications are highlighted in yellow.

Patient Neurologic Complications are central nervous system accidents including brain death, seizures, ischemia, infarcts, and hemorrhage.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/ Modification	Table Name	Column Name / Stored Values
Seizures Clinically determined	Clinically determined by assessment	If more than one instance occurs on the date, only one date is require, time will default to midnight (0000)	07/01/1997 - present	ECLS.ComplicationCodes	Code 311
Seizures Confirmed by EEG	Confirmed by Electroencephalograph	If more than one instance occurs on the date, only one date is require, time will default to midnight (0000)	07/01/1997 - present	ECLS.ComplicationCodes	Code 312
CNS diffuse ischemia (CT/MRI)	CT or MRI demonstrating diffuse ischemic changes	Enter date/time of radiologic confirmation	01/25/2018- present	ECLS.ComplicationCodes	Code 325
CNS Infarction (US or CT or MRI)	CT or US or MRI demonstrating localized ischemic change	Enter date/time of radiologic confirmation	07/01/1997 - present	ECLS.ComplicationCodes	Code 321
Intra/extra parenchymal CNS Hemorrhage (US or CT or MRI)	May be intraparenchymal, subdural or subarachnoid	Enter date/time of radiologic confirmation	01/25/2018- present	ECLS.ComplicationCodes	Code 324
Intraventricular CNS hemorrhage (US or CT or MRI)	>= Grade 2 IVH on US, CT or MRI	Enter date/time of radiologic confirmation	01/25/2018- present	ECLS.ComplicationCodes	Code 323
Neurosurgical intervention performed	Neurosurgical procedure performed during ECLS run (e.g. intracranial pressure monitor, external ventricular drain, craniotomy)		01/25/2018 - present	ECLS.ComplicationCodes	Code 326

Patient Renal Complications

Patient complications are generally defined by their need for intervention, but specific definitions are provided for each Patient Complication below. These complications are listed in drop down under the field name complications. For each complication please enter Date/Time and indicate if the Date/Time is Estimated. If you are not sure of the exact time for the procedure, please select Estimated. Major Complications are highlighted in yellow.

Patient Renal Complications are renal complications defined by change in creatinine or requirement for renal replacement therapy.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/ Modification	Table Name	Column Name / Stored Values
Creatinine 1.5 – 3.0	After ECMO start time, patient newly acquires a creatinine serum measurement of 1.5- 3.0		07/01/1997 - present	ECLS.ComplicationCodes	Code 401
Creatinine > 3.0	After ECMO start time, patient newly acquires a creatinine serum measurement of >3.0		07/01/1997 - present	ECLS.ComplicationCodes	Code 402
Renal Replacement Therapy Required	Peritoneal Dialysis (PD), Continuous Venovenous Hemodiafiltration (CVVHD), Continuous Venovenous Hemofiltration (CVVHF) or Continuous Venovenous Hemodiafiltration (CVVHDF) or Hemodialysis (HD) based on the patient's ultimate mode of therapy		01/25/2018 – present Prior to 1/25/2018 collected separately as Hemofiltration or SCUF or CAVHD or HD	ECLS.ComplicationCodes	Code 415

Patient Cardiovascular Complications

Patient complications are generally defined by their need for intervention, but specific definitions are provided for each Patient Complication below. These complications are listed in drop down under the field name complications. For each complication please enter Date/Time and indicate if the Date/Time is Estimated. If you are not sure of the exact time for the procedure, please select Estimated. Major Complications are highlighted in yellow.

Patient Cardiovascular Complications include cardiopulmonary resuscitation, cardiac arrhythmias, and tamponade.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/ Modification	Table Name	Column Name / Stored Values
CPR required	Chest compressions and cardiopulmonary resuscitation required during ECLS run	Date/time of complication is time of intervention	07/01/1997 - present	ECLS.ComplicationCodes	Code 502
Cardiac arrhythmia	Requiring antiarrhythmic medication infusion, overdrive pacing, cardioversion or defibrillation	Date/time of complication is time of intervention	07/01/1997 - present	ECLS.ComplicationCodes	Code 504
Tamponade (not blood)	Tamponade during ECLS run requiring pericardial drain or mediastinal washout	Date/time of complication is time of intervention	01/25/2018 - present Prior to 1/25/2018 collected as Tamponade: Air or Tamponade Serious	ECLS.ComplicationCodes	Code 544
Tamponade (blood)	Tamponade during ECLS run requiring pericardial drain or mediastinal washout	Date/time of complication is time of intervention	09/01/1997 - present	ECLS.ComplicationCodes	Code 541

Patient Pulmonary Complications

Patient complications are generally defined by their need for intervention, but specific definitions are provided for each Patient Complication below. These complications are listed in drop down under the field name complications. For each complication please enter Date/Time and indicate if the Date/Time is Estimated. If you are not sure of the exact time for the procedure, please select Estimated. Major Complications are highlighted in yellow.

Patient Pulmonary Complications					
Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/ Modification	Table Name	Column Name / Stored Values
Pneumothorax	Requiring insertion of chest drain		07/01/1997 - present	ECLS.ComplicationCodes	Code 601
Pulmonary Hemorrhage	Requiring pRBC transfusion (>20ml/kg/24 hrs of PRBCs or >3U PRBCs/24 hrs in neonates and pediatrics and >3U PRBCs/24 hrs in adults)		07/01/1997 - present 01/25/2018 Specific amounts of blood loss added.	ECLS.ComplicationCodes	Code 602

Patient Metabolic Complications

Patient complications are generally defined by their need for intervention, but specific definitions are provided for each Patient Complication below. These complications are listed in drop down under the field name complications. For each complication please enter Date/Time and indicate if the Date/Time is Estimated. If you are not sure of the exact time for the procedure, please select Estimated. Major Complications are highlighted in yellow.

Patient Metabolic Complications include hyperbilirubinemia, hemolysis and severe hemolysis

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/ Modification	Table Name	Column Name / Stored Values
Hyperbilirubinemia	For neonatal patients (< 28 days) = conjugated bilirubin >20umol/L (>1.2mg/dL). For pediatric (>30days) or adult patients = total bilirubin >170umol/L (> 10mg/dL) or conjugated bilirubin >51umol/L (>3mg/dL), Or need for extracorporeal purification for elevated bilirubin		07/01/1997-1/25/2018 1/25/2018-present Age definitions added	ECLS.ComplicationCodes	Code 821
Moderate hemolysis	Peak plasma hemoglobin 50-100 mg/dL or 500-1000 mg/L occurring at least once during ECLS run. Sustained for at least 2 consecutive days.		1/1/1989-1/25/2018 1/25/2018-present Collected if plasma free Hgb >50	ECLS.ComplicationCodes	Code 822
Severe hemolysis	Peak plasma hemoglobin > 100mg/dL or >1000 mg/L occurring at least once during ECLS run. Sustained for at least 2 consecutive days or if the level of hemolysis leads to a major component change namely the membrane lung, blood pump or entire circuit.		1/25/2018-present	ECLS.ComplicationCodes	Code 823

Patient Limb Complications

Patient complications are generally defined by their need for intervention, but specific definitions are provided for each Patient Complication below. These complications are listed in drop down under the field name complications. For each complication please enter Date/Time and indicate if the Date/Time is Estimated. If you are not sure of the exact time for the procedure, please select Estimated. Major Complications are highlighted in yellow.

Patient Limb Complications

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/ Modification	Table Name	Column Name / Stored Values
Limb Compartment Syndrome	Compartment syndrome occurs when the pressure within a compartment increases, restricting the blood flow to the area and potentially damaging the muscles and nearby nerves. It usually occurs in the legs, feet, arms or hands.		09/06/2013 01/25/2018	ECLS.ComplicationCodes	Code 902
Fasciotomy	Fasciotomy performed secondary to compartment syndrome from ECLS cannulation (fasciotomy performed during ECLS hospitalization)		09/06/2013 01/25/2018	ECLS.ComplicationCodes	Code 903
Limb amputation	Limb amputation secondary to complications from ECLS run (amputation performed during ECLS hospitalization)		09/06/2013 01/25/2018	ECLS.ComplicationCodes	Code 904
Limb ischemia requiring limb reperfusion cannula	Post peripheral cannulation, requiring addition of limb reperfusion cannula >=6 hrs post cannulation		09/06/2013 01/25/2018	ECLS.ComplicationCodes	Code 901

11.INFECTIONS

This section details the infections associated with the patient placed on ECLS. Infections are those that occur prior to and on ECLS. Multiple infections may be entered by selecting 'Add New Infection' (see Registry Instructions)
Refer to the Appendix for a list of available choices for infections.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/ Modification	Table Name	Column Name / Stored Values
Date/Time	Enter the Date/Time of the culture obtained.	Hard Limit Infection Date/Time cannot be after run Time Off.	10/10/2011 - present	ECLS.Infections	CultureTime
Estimated	Click the box if the Date/Time is approximate.		10/10/2011 - present	ECLS.Infections	CultureTimeEstimated No=0 Yes=1
Culture Site	Select where the patient sample was taken from: Blood, Bone, Cerebrospinal fluid, Peritoneal fluid, Pleural fluid, Respiratory tract, Skin/soft tissue, Stool, Urine, Wound – surgical (including cannulation site) Wound – traumatic, other than cannulation site, Other, Unknown		10/10/2011 - present	ECLS.Infections	CultureSiteId 101 Blood 102 Bone 103 Cerebrospinal fluid 104 Peritoneal fluid 105 Pleural fluid 106 Respiratory tract 107 Skin/soft tissue 108 Stool 109 Urine 110 Wound - surgical 111 Wound - traumatic 112 Other 199 Unknown
Organism Type	Select from the drop down box the organism type. All, Unknown, Gram + Bacteria, Gram – Bacteria, Mycobacterium, Fungus (yeast and mold), Viruses and Prions, Protozoa This will populate the specific organism associated in the next box.	Set to unknown if not entered	10/10/2011 - present	Registry.OrganismTypes	TypeId, Description 0 - Unknown 1 - Gram positive bacteria 2 - Gram negative bacteria 3 - Mycobacterium 4 - Fungus (yeast and molds) 5 - Viruses and prions 6 - Protozoa

Infections (continued)					
Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/ Modification	Table Name	Column Name / Stored Values
Organism	Select from the drop down box the specific organism.		10/10/2011 - present	ECLS.Infections	OrganismId Please see Appendix A for full list of Infections

12.OUTCOMES

This section details the discontinuation of ECLS and post ECLS outcomes.

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/ Modification	Table Name	Column Name / Stored Values
Discontinuation Reason	<p>This field identifies the reason a patient was separated from ECLS.</p> <p>Choose one reason for discontinuing ECLS support: Expected recovery: ECLS discontinued because patient improved and is expected to recover. If recovery was due to transplant do not choose recovery; choose appropriate transplant below. Poor Prognosis Followed by Death: ECLS discontinued due to poor prognosis or treatment limitations because the medical team anticipated that the patient had irrecoverable disease; or patient experienced organ failure; or a diagnosis that was incompatible with life; or family/patient perceived poor prognosis or undue suffering and requested discontinuation. Poor Prognosis Followed by Unexpected Survival: ECLS discontinued due to poor prognosis or treatment limitations because the medical team anticipated the patient irrecoverable disease; or patient experienced organ failure; or a diagnosis that was incompatible with life; or family/patient perceived poor prognosis or undue suffering and requested discontinuation. Despite this indication for removal of ECLS, the patient unexpectedly survived to hospital discharge. ECLS complications: A complication of ECLS care required withdrawal of ECLS (such as intracranial hemorrhage). Resource Limitations A lack of equipment, personnel, etc. provided the basis for the decision to discontinue ECLS. Transition to VAD support: In anticipation of continued need for extracorporeal support, the patient was taken off ECLS to be transitioned to an LVAD, RVAD, BiVAD, or Berlin Heart. Pumpless Lung Assist (PA to LA): In anticipation of continued need for extracorporeal support, the patient was taken off ECLS and placed on lung assist device. Heart Tx: Patient was withdrawn from ECLS due to resolved need after new heart transplant. Lung Tx: Patient was withdrawn from ECLS due to resolved need after new lung transplant. Heart/Lung Tx: Patient was withdrawn from ECLS due to resolved need after new heart and lung transplant.</p>		<p>01/01/1989 – 1/15/2018</p> <p>1/15/2018 – present Transition to VAD support; Pumpless Lung Assist (PA to LA); Heart Tx; Lung Tx; Heart/Lung Tx were added</p> <p>04/03/2022-present Poor Prognosis updated to Poor Prognosis Followed by Death</p> <p>Poor Prognosis Followed by Unexpected Survival added</p>	ECLS.Runs	<p>Discontinuation This field can be looked up on ECLS.DiscontinuationCodes But we need this list refreshed.</p> <p>0 = Unknown 1 = Expected Recovery 2 = Poor Prognosis Followed by Death 6 = Resource Limitation 10 = VAD 11 = Pumpless Lung Assist (PA to LA) 12 = Heart Tx 13 = Lung Tx 14 = Heart/Lung Tx 15 = Complication 16 = Poor Prognosis Followed by Unexpected Survival</p>

	Unknown				
Cannula site repair	Select appropriate: both carotid and jugular, common carotid artery, internal jugular vein, none, other		01/01/1989 – present	ECLS.Runs	0 = None 1 = Common Carotid Artery 2 = Internal Jugular Vein 3 = Both Carotid and Jugular 4 = Other

Outcomes (Continued)

Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/ Modification	Table Name	Column Name / Stored Values
Extubated	Select appropriate: endotracheally extubated for at least 48 hours, N/A tracheostomy, N/A transferred intubated, N/A intubated at time of death, N/A other		1/15/2018-present	ECLS.Runs	Extubated 0 = Orotracheally extubated 1 = N/A Tracheostomy 2 = N/A transferred intubated 3 = N/A intubated at time of death 4 = N/A other
Extubation Date	The date/time the oral endotracheal tube is removed	Hard Limit Extubation Date/Time cannot be BEFORE than the Date of Birth. Extubation Date/Time cannot be Before Intubation Date/Time Extubation Date/Time cannot be BEFORE ECLS Start Time Extubation Date/Time cannot be AFTER the time of Death	01/01/1989 – present	ECLS.Runs	ExtubationDate
Discharged Alive	Yes, No or Discharged on ECMO If Discharged on ECMO is selected, choose whether the patient was discharged to an ELSO Center or Non-ELSO Center. Discharged to an ELSO Center will require the entry of the Center ID/Name of Center. These names will autopopulate. Discharged to a non-ELSO Center will require the entry of the Name of Center.	Soft Notification If brain death is selected and Discharged Alive is "Yes" or "OnEcmo": "A patient cannot have brain death and be discharged alive. Please remove brain death or set discharged alive to No." Selection of Discharged on ECMO will drop down choice of ELSO Center or Non ELSO Center. Once type of center selected, enter name of center. ELSO Centers will autopopulate.	01/01/1989 – present 10/08/2018 – present Soft Notification Added 04/03/2022 – present Discharged on ECMO allows choice of from an ELSO Center or Non ELSO Center with center name entry.	ECLS.Runs	DischargedAlive 0 = No 1 = Yes 2 = On ECMO Missing = Null Receiving Transfer ELSO Center Receiving Non-ELSO Center

Date/Time of ICU Discharge	<p>ICU discharge date</p> <p>Please enter the date and time the patient was discharged from the ICU in your hospital.</p> <p>If patient XX was admitted to your Hospital A ICU and transferred from your Hospital A ICU to outside Hospital B ICU on 1/1/2018, then enter date of ICU discharge as 1/1/2018.</p>	<p>Soft Notification Date/Time of ICU Discharge is not often before the ECLS Start Time</p> <p>Hard Limit Date/Time of ICU Discharge cannot be BEFORE ECLS time of birth</p> <p>Date/Time of ICU Discharge cannot be AFTER the time of Death</p>	01/31/2018 – present	ECLS.Runs	DischargeDate
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Outcomes (Continued)					
Field Name	Definition / Explanation / Example	Data Entry Rules	Collection/ Modification	Table Name	Column Name / Stored Values
Date/Time of Hospital Discharge	<p>Hospital discharge date</p> <p>Please enter the date and time the patient was discharged from your hospital. If the patient died during the patient's admission to your hospital please enter the Hospital Discharge date/time as the Death date/time.</p> <p>If patient YY was admitted to your Hospital A and transferred from your Hospital A to outside Hospital B on 2/1/2017, then enter date of ICU discharge as 2/1/2017.</p>	<p>Hard Limit</p> <p>If brain death is not selected: Date/Time of Hospital Discharge cannot be after Death Date/Time</p> <p>If brain death is selected: Date/Time of Hospital Discharge cannot be more than 7 days after Death Date/Time</p> <p>If Discharged on ECMO is selected, the discharge Date/Time will auto-populate as the ECLS Stop Date/Time</p>	<p>01/01/1989 – present</p> <p>10/8/2018 – present</p> <p>Hard Limits added</p>	ECLS.Runs	DischargeDate
Hospital Discharge Location	<p>Select the location the patient was discharged to from your hospital:</p> <p>Home</p> <p>Transferred to another hospital – patient left your hospital to go to another hospital</p> <p>Transfer to LTAC– Long Term Acute Care (LTAC) either outside facility or associated with institution</p> <p>Transfer to Rehab – Rehabilitation center either outside facility or associated with institution</p> <p>Transfer to Hospice – Transferred to a hospice or palliative care facility where the goals of care are comfort, not cure</p> <p>Other, Unknown</p>		<p>01/01/1989 – 1/15/2018</p> <p>1/15/2018-present</p> <p>Transfer to LTAC or rehab;</p> <p>Transfer to hospice</p> <p>Added 7/20/2020-present</p> <p>separated Rehab and LTAC</p>	ECLS.Runs	<p>DischargeLocation</p> <p>This field can be looked up on ECLS.DischargeLocationCodes</p> <p>1 = Home</p> <p>2 = Other, Unknown</p> <p>3 = Transferred to another hospital</p> <p>5 = Transfer to hospice</p> <p>6 = Transfer to LTAC</p> <p>7 = Transfer to Rehab</p>
Death date/time	<p>Please enter the date and time the patient died. This may be the time that Brain Death occurred, but brain death as a complication must be selected.</p>		<p>01/01/1989 – present</p>	ECLS.Runs	DeathDate

APPENDIX A: INFECTIOUS ORGANISMS

Organism ID	Type ID	Description	Organism ID	Type ID	Description
1	1	Staphylococcus aureus	47	5	Epstein-Barr virus (EBV)
2	1	Streptococcus, alpha hemolytic	48	1	Clostridium difficile
9	1	Gram positive, other	49	5	Adenovirus
11	2	Hemophilus influenza	50	4	Aspergillus fumigatus
12	2	Meningococcus	51	4	Aspergillus sp.
13	2	Escherichia coli	52	2	Bacteroides sp.
14	2	Klebsiella pneumoniae	53	4	Candida parapsilosis
15	2	Pseudomonas aeruginosa	54	2	Bordetella pertussis
16	1	Enterococcus	55	2	Citrobacter freundii
19	2	Gram negative, other	56	1	Diphtheroides
21	4	Candida albicans	58	2	Enterobacter cloacae
25	3	Mycobacterium tuberculosis	59	2	Enterobacter sp.
30	3	Acinetobacter sp.	60	1	Streptococcus, group A
31	1	Streptococcus, beta hemolytic	61	1	Streptococcus, group B
32	1	Staphylococcus, coag neg	62	1	Streptococcus, group D
33	1	Streptococcus faecalis	63	5	Influenza A
34	5	Hantavirus	64	5	Influenza B
35	1	Staphylococcus aureus, meth resist	65	6	Pneumocystis carinii
36	1	Streptococcus pneumoniae	66	5	Respiratory syncytial virus (RSV)
37	2	Serratia marsescens	67	1	Streptococcus viridans
38	2	Serratia sp.	68	2	Moraxella catarrhalis (Branhamella)
39	2	Stenotrophomonas maltophilia (Xanthomonas)	69	2	Proteus mirabilis
40	1	Staphylococcus epidermidis	70	2	Proteus sp.
41	4	Yeast sp.	71	2	Klebsiella sp.
42	5	Cytomegalovirus	72	5	Rotavirus
43	5	Herpes simplex virus (HSV)	73	1	Lactobacillus sp.
44	5	Herpes genitalis	74	5	Enterovirus
45	1	Legionella pneumophila	76	4	Torolopsis glabrata
46	1	Legionella sp.	77	2	Neisseria meningitidis

APPENDIX A: INFECTIOUS ORGANISMS (Continued)

Organism ID	Type ID	Description	Organism ID	Type ID	Description
78	2	Neisseria gonorrhoea	106	2	Salmonella sp.
79	1	Bacillus cereus	107	5	HIV
80	1	Bacillus sp.	108	5	Enterovirus D68
81	4	Candida krusei	115	1	Staphylococcus aureus, meth sens
82	4	Candida tropicalis	217	2	Neisseria sp.
83	2	Chlamydia trachomatis	218	5	Rhinovirus
84	2	Chlamydia sp.	219	4	Blastomycosis
85	2	Citrobacter sp.	220	5	Coronavirus
86	1	Corynebacterium jejunum	221	2	Acinetobacter baumannii
87	1	Flavobacterium sp.	222	2	Burkholderia cepacia
88	5	Hepatitis A	223	2	Acinetobacter
89	5	Hepatitis B	224	5	Herpes Virus 6
90	5	Hepatitis C	225	5	Parvo Virus B19
91	2	Hemophilus parainfluenzae	226	3	Mycobacterium chimera
92	2	Klebsiella oxytoca	227	5	Human Metapneumovirus
93	1	Listeria monocytogenes	228	2	Cupriavidus metallidurans
94	5	Parainfluenza	229	5	SARS-CoV-2
95	2	Pseudomonas fluorescens	230	2	Elizabethkingia meningoseptica
96	2	Serratia luginfaciens	231	2	Pantoea agglomerans
97	1	Staphylococcus hominis	232	4	Rhizopus species
98	1	Staphylococcus scuri	233	2	Bacteroides fragilis
99	4	Candida sp.	234	2	Klebsiella aerogenes
100	0	Other	235	2	Alcaligenes xylosoxidans
101	5	Herpes zoster (varicella-zoster)			
102	1	Clostridium perfringens			
103	6	Toxoplasma gondii			
104	1	Mycoplasma pneumoniae			
105	2	Ureaplasma urealyticum			