# ECLS Registry Form

## Extracorporeal Life Support Organization (ELSO)

Please refer to the ELSO Registry Data Definitions Document for Details

Unique ID: _____ Birth Date: _____
(include time for neonates)

Sex: _____ (M, F, unknown) Race: _____(Asian, Black, Hispanic, White, Middle Eastern or North African, Native American, Native Pacific Islander, Other, Unknown)

## Run Information

Date/Time On: _____ Date/Time Off: _____ Support Type: ☐ Pulmonary ☐ Cardiac ☐ ECPR
Run No: _____
Weight (kg): _____ Height (cm): _____

Intubation:
☐ Yes, Date Known: _____
☐ Pre-existing Trach: _____
☐ Yes, Date Estimated: _____
☐ Yes, Date Unknown
☐ No

Invasive Ventilation:
☐ Yes,New Date/Time: _____
☐ Pre-existing Ventilation: _____
☐ Yes, Date/Time Estimated: _____
☐ Yes, Date/Time unknown
☐ No

***Neonatal patients only:***

Birth weight (kg): _____ Gestational age: _____
Apgar (1 min): _____ Delivery: _____ (Vaginal, ER or Elective C-section, Unknown)
Apgar (5 min): _____ Maternal age: _____
CDH: ☐ Y ☐ N ☐ Unknown CDH Prenatal diagnosis: ☐ Y ☐ N ☐ Unknown
CDH Side: _____ (Right,Left,Bilateral, Unknown)
Repair: _____ (None, Pre-ECLS,On ECLS, Post-ECLS)

## Pre-ECLS Assessment

**ABG:** Closest to/before ECLS, no more than 6 hours before ECLS

Date/Time: _____
FiO2 (at ABG draw): _____(%)
Lactate: _____
pH: _____ Unknown? ☐
PaCO2: _____
PaO2: _____
HCO3: _____Unknown? ☐
SaO2(%): _____
SpO2 (%): _____

**Vent Settings:** Closest to/before ECLS, no more than 6 hours before ECLS

No Ventilator in use: ☐
Date/Time: _____
Vent Type: _____
Rate/Hz: _____
PIP/Ampl: _____
PEEP: _____
MAP: _____
Hand bagging: ☐ Y ☐ N ☐ Unknown
(Select if hand bagged beginning in the 6hrs pre ECLS AND continuing to the time of cannulation)

**Hemodynamics** (Closest to and before ECLS start, ideally no more than 6 hours before ECLS start)

Date/Time: _____ SBP Unknown? ☐

BP: _____ _____ _____ SvO2: _____ PCWP: _____
Systolic Diastolic Mean

PAP: _____ _____ _____ CI: _____
Systolic Diastolic Mean

## Pre ECLS Support

Hospital Admit Date/Time: _____

☐ Transported on ECMO ☐ Transported not on ECMO ☐ Not Transported ☐ Unknown

Pre-ECLS cardiac arrest: ☐ Y ☐ N ☐ Unknown

Bridge to transplant: ☐ Y ☐ N ☐ Unknown

Is Trauma the underlying reason for ECLS? ☐ Y ☐ N ☐ Unknown

### Mechanical Cardiac Support (Select those used or in place within 24 hours pre ECLS)

☐ Berlin Heart ☐ BiVAD ☐ Cardiac pacemaker ☐ Cardiopulmonary bypass (CPB) ☐ Intra-aortic balloon ☐ LVAD
☐ Perc Ventricular Assist Device ☐ RVAD

### Renal, Pulmonary and Other Support (Select those used or in place within 24 hours pre ECLS)

☐ Inhaled Anesthetic ☐ Inhaled Epoprostenol (>6 hours) ☐ Inhaled Nitric oxide (>6 hours) ☐ Liquid ventilation ☐ Plasmapheresis
☐ Prone Positioning (>16 hours) ☐ Renal Replacement Therapy ☐ Surfactant ☐ Therapuetic Hypothermia < 35 degrees C

### Medications Excluding Vasoactives (Select those used or in place within 24 hours pre ECLS)

☐ Alprostadil ☐ IV Bicarbonate ☐ Epoprostenol (all synthetic prostacyclin analogues) ☐ Narcotics ☐ Neuromuscular blockers
☐ Sildenafil ☐ Systemic Steriods ☐ THAM

### Vasoactive Infusions (Select those used within 24 hours AND continuously for 6 hours pre ECLS)

☐ Dobutamine ☐ Dopamine ☐ Enoximone ☐ Epinephrine ☐ Esmolol ☐ Levosimendan ☐ Metaraminol ☐ Metoprolol
☐ Milrinone ☐ Nicardipine ☐ Nitroglycerin ☐ Nitroprusside ☐ Norepinephrine ☐ Phenylephrine ☐ Tolazoline ☐ Vasopressin

## ECLS Assessment

### Arterial Blood Gas

Closest to 24 hours after ECLS start, but no less than 18 hours and not more than 30 hours after ECLS start

Date/Time: _____
FiO2 (at ABG draw): _____(%)
Lactate: _____
pH: _____ Unknown? ☐
PaCO2: _____
PaO2: _____
HCO3: _____ Unknown? ☐
SaO2(%): _____
SpO2 (%): _____

### Ventilator Settings

No Ventilator in use: ☐
Date/Time: _____
Vent Type: _____
Rate/Hz: _____
PIP/Ampl: _____
PEEP: _____
MAP: _____
Hand bagging: ☐ Y ☐ N ☐ Unknown

### Hemodynamics Closest to 24 hours after ECLS start, but no less than 18 hours and not more than 30 hours after ECLS start

Date/Time: _____ (Select option if SBP/DBP is unavailable or unknown)

BP: _____ (Systolic) _____ (Diastolic) _____ (Mean) SvO2: _____ PCWP: _____

PAP: _____ (Systolic) _____ (Diastolic) _____ (Mean) CI: _____

### Blood Pump Flow Rates (L/min)

Pump flow at 4 hours: _____ Pump flow at 24 hours: _____

## ECLS Care

### Unit Where Majority of ECLS Care Received

☐ Adult Medicine ICU ☐ Adult Surgical ICU ☐ Adult Cardiac ICU ☐ Adult Cardiovascular ICU ☐ ECLS ICU ☐ Emergency Dept. ☐ Burn ICU

☐ Mixed ICU ☐ Neonatal ICU ☐ Pediatric ICU ☐ Pediatric Cardiac ICU ☐ Operating Room/Cath Lab ➡ Initiated for procedure? Yes No

### Nutrition and Mobility

Enteral Feeding Date/Time (started and continued for at least 2 days) _____

| Level of Mobilization at day 7 of ECLS (>8 years) | Maximum Level Achieved During ECLS (>8 years) |
|---|---|
| ☐ 0 Nothing (lying in bed) | ☐ 0 Nothing (lying in bed) |
| ☐ 1 Sitting in bed, exercises in bed | ☐ 1 Sitting in bed, exercises in bed |
| ☐ 2 Passively moved to chair (no standing) | ☐ 2 Passively moved to chair (no standing) |
| ☐ 3 Sitting over edge of bed | ☐ 3 Sitting over edge of bed |
| ☐ 4 Standing (with or without assist) | ☐ 4 Standing (with or without assist) |
| ☐ 5 Transferring bed to chair | ☐ 5 Transferring bed to chair |
| ☐ 6 Marching on spot (at bedside) | ☐ 6 Marching on spot (at bedside) |
| ☐ 7 Walking with assistance of 2 or more people | ☐ 7 Walking with assistance of 2 or more people |
| ☐ 8 Walking with assistance of 1 person | ☐ 8 Walking with assistance of 1 person |
| ☐ 9 Walking independently with a gail aid | ☐ 9 Walking independently with a gail aid |
| ☐ 10 Walking independently without a gait aid | ☐ 10 Walking independently without a gait aid |

## Mode and Cannulations

### Initial Mode of ECLS

ECLS Start Date/Time: _____ ECLS/Mode Stop Date/Time: _____

ECLS mode: ☐ V-A (Venoarterial) ☐ V-V (Venovenous) ☐ V-VA (Veno - venoarterial) ☐ A-VCO2R ☐ VV-ECO2R ☐ Other ☐ Unknown

### Cannulas Placed for the Initial Mode of ECLS

| | Cannula #1 | Cannula #2 | Cannula #3 | Cannula #4 | Cannula #5 |
|---|---|---|---|---|---|
| | Note: Times will autopopulate with time on and off ECLS. Only note new date/time for cannulas placed/removed during the run. | | | | |
| Start Date/Time | | | | | |
| End Date/Time | | | | | |
| Manufacturer | | | | | |
| Cannula Model/Size | | | | | |
| Pre-Existing? | | | | | |
| Percutaneous? | | | | | |
| Site (Note if Drain Y/N) | | | | | |
| Replaced? | | | | | |
| Reason? | | | | | |

Please see the Data Definitions document for specific fields' definitions.

## Equipment

| Membrane Lung | #1 | #2 | #3 |
|---|---|---|---|
| Start Date/Time | | | |
| End Date/Time | | | |
| Manufacturer | | | |
| Device | | | |
| Membrane Replaced? Reason? | | | |
| **Blood Pump** | **#1** | **#2** | **#3** |
| Start Date/Time | | | |
| End Date/Time | | | |
| Manufacturer | | | |
| Device | | | |
| Pump Replaced? Reason? | | | |

| Other Equipment | Manufacturer | Device |
|---|---|---|
| Heat Exchanger | | |
| Hemofilter | | |
| Temp Regulation Device | | |

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| Membrane Lung | #4 | #5 | #6 |
|---|---|---|---|
| Start Date/Time | | | |
| End Date/Time | | | |
| Manufacturer | | | |
| Device | | | |
| Membrane Replaced? Reason? | | | |
| **Blood Pump** | **#4** | **#5** | **#6** |
| Start Date/Time | | | |
| End Date/Time | | | |
| Manufacturer | | | |
| Device | | | |
| Pump Replaced? Reason? | | | |

| Other Equipment | Manufacturer | Device |
|---|---|---|
| Heat Exchanger | | |
| Hemofilter | | |
| Temp Regulation Device | | |

Duplicate this page as required for multiple changes

## Add New Mode Conversion (this section to be used only for mode conversions – must enter a Stop Date/Time for the initial mode)

ECLS Start Date/Time: _____ ECLS/Mode Stop Date/Time: _____

ECLS mode: ☐ V-A (Venoarterial) ☐ V-V (Venovenous) ☐ V-VA (Veno venoarterial) ☐ A-VCO2R
☐ VV-ECCO2R ☐ Other ☐ Unknown

**Cannulas Placed for this Mode of ECLS**

| | Cannula #1 | Cannula #2 | Cannula #3 | Cannula #4 | Cannula #5 |
|---|---|---|---|---|---|
| | Note: Times will autopopulate with time on and off ECLS. Only note new date/time for cannulas placed during the run. | | | | |
| Start Date/Time | | | | | |
| End Date/Time | | | | | |
| Manufacturer | | | | | |
| Cannula Model/Size | | | | | |
| Pre-Existing? | | | | | |
| Percutaneous? | | | | | |
| Site (Note if Drain Y/N) | | | | | |
| Replaced? | | | | | |
| Reason? | | | | | |

## Add Another Mode Conversion (this section to be used only for mode conversions – must enter a Stop Date/Time for the previous mode)

ECLS Start Date/Time: _____ ECLS/Mode Stop Date/Time: _____

ECLS mode: ☐ V-A (Venoarterial) ☐ V-V (Venovenous) ☐ V-VA (Veno venoarterial) ☐ A-VCO2R
☐ VV-ECCO2R ☐ Other ☐ Unknown

**Cannulas Placed for this Mode of ECLS**

| | Cannula #1 | Cannula #2 | Cannula #3 | Cannula #4 | Cannula #5 |
|---|---|---|---|---|---|
| | Note: Times will autopopulate with time on and off ECLS. Only note new date/time for cannulas placed during the run. | | | | |
| Start Date/Time | | | | | |
| End Date/Time | | | | | |
| Manufacturer | | | | | |
| Cannula Model/Size | | | | | |
| Pre-Existing? | | | | | |
| Percutaneous? | | | | | |
| Site (Note if Drain Y/N) | | | | | |
| Replaced? | | | | | |
| Reason? | | | | | |

Duplicate this page as required for multiple mode changes

## ICD-10 Diagnoses

Primary Diagnosis: _____(check box as primary)

| Secondary Diagnoses: (unlimited) | |
|---|---|
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## CPT Procedure Codes (List all relevant procedures related to the patient even if preceding this admission)

| Date/Time | Estimated? Y/N | Code/Procedure |
|---|---|---|
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## ECLS Complications (Refer to ELSO Data Definitions for Specific Details)

*Enter multiple complications of the same type by 'add new complication' with new date/time.*
*Complications that 'continue' for several days only need the first date of occurrence.*

| Date/Time | Mechanical | Definition |
|---|---|---|
| | Oxygenator Failure | *Requiring change due to clot formation or gas exchange failure or blood leak* |
| | Pump Failure | *Requiring hand cranking or pump exchange* |
| | Raceway Rupture | *In a roller pump rupture of the raceway tubing* |
| | Other Tubing Rupture | *Rupture of ECLS tubing* |
| | Cannula Problems | *Requiring intervention (reposition or exchange) for misplacement, dislodgement, replacement due to clots/fibrin, mechanical failure or inappropriate position* |
| | Circuit Change | *Entire circuit (with exception of cannulae) changed due to clot formation or mechanical failure* |
| | Heat Exchanger Malfunction | *Malfunction of heat exchanger leading to unintentional hypothermia <35C or hyperthermia >39* |
| | Thombosis/Clots: Circuit Component | *Circuit component (e.g. pigtails, connectors, bridge, arterial or venous tubing) requiring change due to clot formation or mechanical failure* |
| | Clots Hemofilter | *Clots in hemofilter causing hemofilter to need to be changed or to fail* |
| | Air in Circuit | *Requiring circuit intervention or circuit clamping for bubble detector alarm, visualized air, air entry into patient* |

| Date/Time | Hemorrhage | Definition |
|---|---|---|
| | GI Hemorrhage | *Upper or lower GI hemorrhage requiring PRBC transfusion (>20ml/kg/24 hrs of PRBCS or >3U PRBCs/24 hrs in neonates and pediatrics or >3U PRBCS/24 hrs in adults), and/or,*<br>*endoscopic intervention, and/or hemostatic agent deployment* |
| | Peripheral Cannulation Site Bleeding | *Select this complication if there is bleeding from a peripheral cannulation site such as the neck, groin, or axilla.*<br><br>*Peripheral cannulation site bleeding requiring PRBC transfusion (>20ml/kg/24 hrs of PRBCS or ≥3U PRBCs/24 hrs in neonates and pediatrics or ≥3U PRBCS/24 hrs in adults) and/or, surgical intervention (includes intravascular hemostatic agent deployment).*<br>*A reperfusion cannula is a type of peripheral cannulation site.* |
| | Mediastinal Cannulation Site Bleeding | *Select this complication if there is bleeding from cannulae that are placed across the mediastinum.*<br><br>*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 ≥3U PRBCs/24 hrs in neonates and pediatrics or ≥3U PRBCS/24 hrs in adults, and/or surgical intervention.* |
| | Surgical Site Bleeding | *Select this complication if there is bleeding from a surgical site other than mediastinal or peripheral cannulation site.*<br><br>*Requiring PRBC transfusion (>20ml/kg/24 hrs of PRBCS or ≥3U PRBCs/24 hrs in neonates and pediatrics or ≥3U PRBCS/24 hrs in adults), and/or surgical intervention* |

| Date/Time | Neurological | Definition |
|---|---|---|
| | Brain Death | *Select this complication if a patient suffered brain death or neurological determination of death.*<br><br>Please refer to Data Definitions for specific criteria. |

| Date/Time | Neurological | Definition |
|---|---|---|
| | Seizures Clinically Determined | *Clinically determined by assessment* |
| | Seizures Confirmed by EEG | *Confirmed by Electroencephalograph* |

| Date/Time | Neurological | Definition |
|---|---|---|
| | CNS Diffuse Ischemia (CT/MRI) | *CT or MRI demonstrating diffuse ischemic changes* |
| | CNS Infarction (US or CT or MRI) | *CT or US or MRI demonstrating localized ischemic change* |
| | Intra/extra Parenchymal CNS Hemorrhage (US or CT or MRI) | *May be intraparenchymal, subdural or subarachnoid* |
| | Intraventricular CNS Hemorrhage (US or CT or MRI) | *>= Grade 2 IVH on US, CT or MRI* |
| | Neurosurgical intervention performed | *Neurosurgical procedure performed during ECLS run (e.g. intracranial pressure monitor, external ventricular drain, craniotomy)* |

| Date/Time | Renal | ***Definition*** |
|---|---|---|
| | Creatinine 1.5 – 3.0 | *After ECMO start time, patient newly acquires a creatinine serum measurement of 1.5- 3.0* |
| | Creatinine > 3.0 | *After ECMO start time, patient newly acquires a creatinine serum measurement of >3.0* |
| | 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* |

| Date/Time | Cardiovascular | ***Definition*** |
|---|---|---|
| | CPR Required | *Chest compressions and cardiopulmonary resuscitation required during ECLS run* |
| | Cardiac Arrhythmia | *Requiring antiarrhythmic medication infusion, overdrive pacing, cardioversion or defibrillation* |
| | Tamponade (not blood) | *Tamponade during ECLS run requiring pericardial drain or mediastinal washout* |
| | Tamponade (blood) | *Tamponade during ECLS run requiring pericardial drain or mediastinal washout* |

| Date/Time | Pulmonary | Definiton |
|---|---|---|
| | Pneumothorax | *Requiring insertion of chest drain* |
| | 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)* |

| Date/Time | Metabolic | ***Definition*** |
|---|---|---|
| | Hyperbilirubinemia | *For neonatal patients (< 28 days) = conjugated bilirubin >20umol/L (>1.2mg/dL).*<br>*For pediatric (>30days) or adult patients = total bilirubin >170umol/L (> 10mg/dL) or conjugated bilirubin >51umol/L (>3mg/dL),*<br>*Or need for extracorporeal purification for elevated bilirubin* |
| | 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* |
| | 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* |

| Date/Time | Patient Limb | ***Definition*** |
|---|---|---|
| | Fasciotomy | *Fasciotomy performed secondary to compartment syndrome from ECLS cannulation (fasciotomy performed during ECLS hospitalization)* |
| | Limb Amputation | *Limb amputation secondary to complications from ECLS run (amputation performed during ECLS hospitalization)* |
| | Limb Ischemia Requiring Limb Reperfusion Cannula | *Post peripheral cannulation, requiring addition of limb reperfusion cannula >=6 hrs post cannulation* |

 

## Infections (pre and those occurring on ECMO)

| Date/Time/Estimated? | Culture Site | Organism Type | Organism |
|---|---|---|---|
| | | | |
| | | | |
| | | | |
| | | | |

Sites: Blood, Bone, Cerebrospinal fluid, Peritoneal fluid, Pleural fluid, Respiratory tract, Skin/soft tissue, Stool, Urine, Wound – surgical, Wound – traumatic, Other, Unknown

Type: All, Unknown, Gram + Bacteria, Gram – Bacteria, Mycobacterium, Fungus (yeast and mold), Viruses and Prions, Protozoa

Organisms are listed in the Data Definiitons. If an organism is not listed, please contact prycus@elso.org

# Outcomes

## Discontinuation Reason (Why the patient was separated from ECLS)

- ☐ Unknown
- ☐ Expected recovery
- ☐ Poor prognosis
- ☐ Resource limitation
- ☐ ECLS complication
- ☐ Transition to VAD Support
- ☐ Pumpless Lung Assist (Pa to LA)
- ☐ Heart transplant
- ☐ Lung transplant
- ☐ Heart and lung transplant

## Cannulation Repair

- ☐ None
- ☐ Internal Jugular Vein
- ☐ Other
- ☐ Common Carotid Artery
- ☐ Both Carotid and Jugular

## Extubated

- ☐ Endotracheally extubated ≥ 48 hrs
- ☐ N/A - Transferred intubated
- ☐ N/A - Other
- ☐ N/A - Tracheostomy
- ☐ N/A - Intubated at time of death

Oral Endotracheal Tube Removed Date/Time: _____

## Discharged Alive

☐ Yes ☐ No ☐ On ECMO

ICU Discharge Date/Time: _____

Hospital Discharge Date/Time: _____

Death Date/Time: _____

## Discharge Location

- ☐ Home
- ☐ Transferred to Other Hospital
- ☐ Other
- ☐ Transferred to Long Term Care or Rehab
- ☐ Transfer to Hospice
- ☐ Unknown

Form completed by: _____ *Completed date is automatically added when you submit the run.*
Select Validate Data – to assure mandatory fields complete, dates are correct.
Select Submit and Lock – to finalize the record and submit to ELSO.