

ABBOTT CODING GUIDE

EXTRACORPOREAL MEMBRANE OXYGENATION (ECMO)

**CENTRIMAG™ ACUTE CIRCULATORY SUPPORT SYSTEM INCLUDING THE
CENTRIMAG™ BLOOD PUMP AND PEDIMAG™ BLOOD PUMP**

Effective January 1, 2021

EXTRACORPOREAL MEMBRANE OXYGENATION (ECMO)

Effective January 1, 2021

Introduction

The Extracorporeal Membrane Oxygenation (ECMO) Coding Guide is intended to provide coding and reimbursement information for physicians and hospitals regarding the FDA enforcement policy during the COVID-19 pandemic for the CentriMag™ Acute Circulatory Support System including the CentriMag™ pump and the PediMag™ pump to be used in an ECMO circuit for more than 6 hours. For coding and reimbursement information regarding utilization of the CentriMag™ Acute Circulatory Support System for ventricular support, please visit:

<https://www.cardiovascular.abbott/us/en/hcp/reimbursement/hf.html>

Reimbursement Hotline

In addition, Abbott offers a reimbursement hotline, which provides live coding and reimbursement information from dedicated reimbursement specialists. Coding and reimbursement support is available from 8 a.m. to 5 p.m. central time, Monday through Friday at (855) 569-6430 or hce@abbott.com. This guide and all supporting documents are available:

<https://www.cardiovascular.abbott/us/en/hcp/reimbursement/hf.html>.

Coding and reimbursement assistance is provided subject to the disclaimers set forth in this guide.

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EXTRACORPOREAL MEMBRANE OXYGENATION (ECMO)

The provided terms and definitions are to assist with the language utilized in the codes that support ECMO procedures per CMS definitions. This is not an exhaustive list of terms that pertain to ECMO. For additional terms please visit:

<https://www.else.org/Resources/GlossaryofTerms.aspx>

EXTRACORPOREAL MEMBRANE OXYGENATION

ECMO is an advanced life support technique used in critically ill patients who are felt to have severe cardiopulmonary insufficiency that has not responded to conventional management. While on ECMO, a patient's blood is continuously circulated from the body through the ECMO machine where it is oxygenated and then returned back into the patient, thus temporarily replacing lung function (e.g., Veno-venous ECMO) or both heart and lung functions (e.g., Veno-arterial ECMO).

VA ECMO (VENO-ARTERIAL ECMO) (FIG 1)

A type of ECMO that drains blood from a vein, oxygenates the blood in the circuit, and returns the blood to the body through an artery. This type of ECMO can be used to support both the heart and lungs

VV ECMO (VENO-VENOUS ECMO) (FIG 2)

A type of ECMO that drains blood from a vein, oxygenates the blood in the circuit, and returns the blood through a vein. This type of ECMO is used when only the lungs need support

PERIPHERAL CANNULATION

insertion of cannulae via the femoral, cervical, or axillary vessels either by open surgical cutdown or percutaneously.

PERIPHERAL CANNULATION OPEN APPROACH

A technique of peripheral cannulation where a surgical cut down is utilized to access the femoral, cervical, or axillary vessels.

PERIPHERAL CANNULATION PERCUTANEOUS APPROACH

A technique of peripheral cannulation where access to the femoral, cervical, or axillary vessels is established percutaneously without a cutdown.

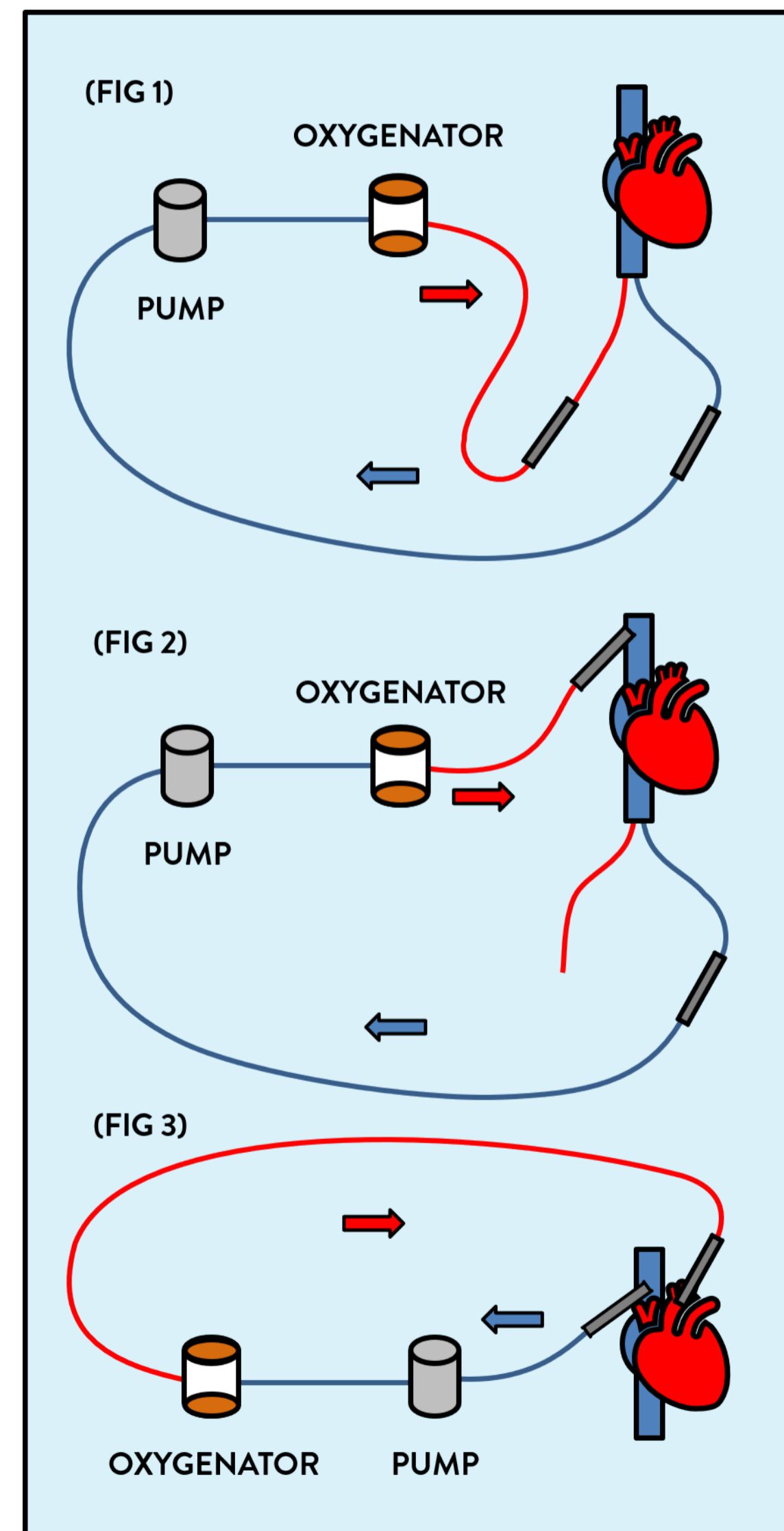
CENTRAL CANNULATION (FIG 3, VA ECMO SHOWN)

A technique of cannulation accomplished via insertion of cannulae directly into the cardiac chambers or great vessels.

INTRAOPERATIVE ECMO SUPPORT

ECMO provided during the course of surgery

<https://www.cms.gov/Medicare/Coding/ICD10/Downloads/2019-ICD10-March-Agenda-Handouts.pdf>



COVERAGE FOR ACUTE CIRCULATORY SUPPORT SYSTEM

Effective April 6, 2020

The FDA recently issued guidance allowing for FDA-cleared or approved cardiopulmonary bypass devices to be used in an ECMO circuit for more than 6 hours to treat patients who are experiencing acute respiratory failure and/or acute cardiopulmonary failure during the COVID-19 public health emergency.

Acute Mechanical Circulatory Support Systems, such as the CentriMag™ device, are generally covered as a medically necessary procedure under most commercial payer policies for Mechanical Circulatory Assist Devices (Ventricular Assist Devices, Percutaneous Ventricular Assist Devices and Artificial Hearts). These commercial policies have been long-established as a clinically efficacious treatment for temporary circulatory support for individuals who have limited options for short-term cardiac support to improve function of the native heart as part of life-sustaining therapy. The Centers for Medicare and Medicaid Services (CMS) does not have a national coverage determination (NCD) for external heart assist procedures involving technologies like CentriMag and coverage is based on medical necessity. It is strongly encouraged that you verify with your local and commercial payer policies to ensure medical appropriateness.

TYPE OF SUPPORT	REGULATORY PATHWAY	INDICATION
Left ventricular support	PMA Approval	Up to 30 days to treat post-cardiotomy patients who fail to wean from cardiopulmonary bypass*
Right ventricular support	PMA Approval	Up to 30 days to treat post-cardiotomy patients who fail to wean from cardiopulmonary bypass*
	Humanitarian Device Exemption	Up to 30 days for patients in cardiogenic shock due to acute right ventricular failure*
Bi-ventricular support	PMA Approval	Up to 30 days to treat post-cardiotomy patients who fail to wean from cardiopulmonary bypass*
In use during Cardiopulmonary support	510(k) Clearance	Periods appropriate to cardiopulmonary bypass (up to six hours)

* Excludes PediMag™

Abbott. CentriMag™ Acute Circulatory Support System. Indications, Safety & Warnings.
<https://www.cardiovascular.abbott/us/en/hcp/products/heart-failure/centrimag-acute-circulatory-support-system.html>

CODING AND REIMBURSEMENT FOR EXTRACORPOREAL MEMBRANE OXYGENATION

Physician¹

CPT# CODE	DESCRIPTION	WORK RVU	NATIONAL MEDICARE FACILITY RATE
EXTRACORPOREAL MEMBRANE OXYGENATION (ECMO)/EXTRACORPOREAL LIFE SUPPORT (ECLS) PROVIDED BY PHYSICIAN;			
33951	Insertion of peripheral (arterial and/or venous) cannula(e), percutaneous , birth through 5 years of age (includes fluoroscopic guidance, when performed)	8.15	\$431
33952	Insertion of peripheral (arterial and/or venous) cannula(e), percutaneous , 6 years and older (includes fluoroscopic guidance, when performed)	8.15	\$435
33953	Insertion of peripheral (arterial and/or venous) cannula(e), open , birth through 5 years of age	9.11	\$482
33954	Insertion of peripheral (arterial and/or venous) cannula(e), open , 6 years and older	9.11	\$485
33955	Insertion of central cannula(e) by sternotomy or thoracotomy , birth through 5 years of age	16.00	\$843
33956	Insertion of central cannula(e) by sternotomy or thoracotomy , 6 years and older	16.00	\$850

Per CPT, insertion includes Cannula replacement in same vessel, and Cannula repositioning during the same episode of care

The CPT# codes above describe possible surgeon services in the hospital inpatient setting where the Acute MCS system procedure (e.g., CentriMag™ or PediMag™ Pumps) occurs. These services are restricted to the inpatient hospital site of service.

It is incumbent upon the physician to determine which, if any modifiers should be used first. A list of CPT# code modifiers can be found at <https://www.cardiovascular.abbott/us/en/hcp/reimbursement/hf.html>

Effective Dates: January 1, 2021 - December 31, 2021

CODING AND REIMBURSEMENT FOR EXTRACORPOREAL MEMBRANE OXYGENATION

Physician¹

CPT [‡] CODE	DESCRIPTION	WORK RVU	NATIONAL MEDICARE FACILITY RATE
EXTRACORPOREAL MEMBRANE OXYGENATION (ECMO)/EXTRACORPOREAL LIFE SUPPORT (ECLS) PROVIDED BY PHYSICIAN;			
33946	Initiation, veno-venous	6.00	\$315
33947	Initiation, veno-arterial	6.63	\$350
33948	Daily management, each day, veno-venous	4.73	\$243
33949	Daily management, each day, veno-arterial	4.60	\$236

Per CPT, code initiation codes on day of initial service, daily management codes are excluded on day of initial service.

The CPT[‡] codes above describe possible surgeon services in the hospital inpatient setting where the Acute MCS system procedure (e.g., CentriMag™ or PediMag™ Pumps) occurs. These services are restricted to the inpatient hospital site of service.

It is incumbent upon the physician to determine which, if any modifiers should be used first. A list of CPT[‡] code modifiers can be found at <https://www.cardiovascular.abbott/us/en/hcp/reimbursement/hf.html>

Effective Dates: January 1, 2021 - December 31, 2021

CODING AND REIMBURSEMENT FOR EXTRACORPOREAL MEMBRANE OXYGENATION

Physician¹

CPT [‡] CODE	DESCRIPTION	WORK RVU	NATIONAL MEDICARE FACILITY RATE
EXTRACORPOREAL MEMBRANE OXYGENATION (ECMO)/EXTRACORPOREAL LIFE SUPPORT (ECLS) PROVIDED BY PHYSICIAN;			
33957	Reposition peripheral (arterial and/or venous) cannula(e), percutaneous , birth through 5 years of age (includes fluoroscopic guidance, when performed)	3.51	\$187
33958	Reposition peripheral (arterial and/or venous) cannula(e), percutaneous , 6 years and older (includes fluoroscopic guidance, when performed)	3.51	\$187
33959	Reposition peripheral (arterial and/or venous) cannula(e), open , birth through 5 years of age (includes fluoroscopic guidance, when performed)	4.47	\$239
33962	Reposition peripheral (arterial and/or venous) cannula(e), open , 6 years and older (includes fluoroscopic guidance, when performed)	4.47	\$239
33963	Reposition of central cannula(e) by sternotomy or thoracotomy , birth through 5 years of age (includes fluoroscopic guidance, when performed)	9.00	\$476
33964	Reposition central cannula(e) by sternotomy or thoracotomy , 6 years and older (includes fluoroscopic guidance, when performed)	9.50	\$502

Per CPT, do not report repositioning codes with initiation or insertion codes on same day of service

The CPT[‡] codes above describe possible surgeon services in the hospital inpatient setting where the Acute MCS system procedure (e.g., CentriMag™ or PediMag™ Pumps) occurs. These services are restricted to the inpatient hospital site of service.

It is incumbent upon the physician to determine which, if any modifiers should be used first. A list of CPT[‡] code modifiers can be found at <https://www.cardiovascular.abbott/us/en/hcp/reimbursement/hf.html>

Effective Dates: January 1, 2021 - December 31, 2021

CODING AND REIMBURSEMENT FOR EXTRACORPOREAL MEMBRANE OXYGENATION

Physician¹

CPT [‡] CODE	DESCRIPTION	WORK RVU	NATIONAL MEDICARE FACILITY RATE
EXTRACORPOREAL MEMBRANE OXYGENATION (ECMO)/EXTRACORPOREAL LIFE SUPPORT (ECLS) PROVIDED BY PHYSICIAN;			
33965	Removal of peripheral (arterial and/or venous) cannula(e), percutaneous , birth through 5 years of age	3.51	\$187
33966	Removal of peripheral (arterial and/or venous) cannula(e), percutaneous , 6 years and older	4.50	\$241
33969	Removal of peripheral (arterial and/or venous) cannula(e), open , birth through 5 years of age	5.22	\$278
33984	Removal of peripheral (arterial and/or venous) cannula(e), open , 6 years and older	5.46	\$289
33985	Removal of central cannula(e) by sternotomy or thoracotomy , birth through 5 years of age	9.89	\$523
33986	Removal of central cannula(e) by sternotomy or thoracotomy , 6 years and older	10.00	\$533

The CPT[‡] codes above describe possible surgeon services in the hospital inpatient setting where the Acute MCS system procedure (e.g., CentriMag™ or PediMag™ Pumps) occurs. These services are restricted to the inpatient hospital site of service.

It is incumbent upon the physician to determine which, if any modifiers should be used first.
 A list of CPT[‡] code modifiers can be found at <https://www.cardiovascular.abbott/us/en/hcp/reimbursement/hf.html>

Effective Dates: January 1, 2021 - December 31, 2021

CODING AND REIMBURSEMENT FOR EXTRACORPOREAL MEMBRANE OXYGENATION

Physician¹

CPT [‡] CODE	DESCRIPTION	WORK RVU	NATIONAL MEDICARE FACILITY RATE
EXTRACORPOREAL MEMBRANE OXYGENATION (ECMO)/EXTRACORPOREAL LIFE SUPPORT (ECLS) PROVIDED BY PHYSICIAN;			
+33987	Arterial exposure with creation of graft conduit (eg, chimney graft) to facilitate arterial perfusion for ECMO/ECLS (List separately in addition to code for primary procedure)*	4.04	\$213
33988	Insertion of left heart vent by thoracic incision (eg, sternotomy, thoracotomy) for ECMO/ECLS	15.00	\$792
33989	Removal of left heart vent by thoracic incision (eg, sternotomy, thoracotomy) for ECMO/ECLS	9.50	\$502

*Per CPT, Use 33987 in conjunction with 33953, 33954, 33955, 33956

The CPT[‡] codes above describe possible surgeon services in the hospital inpatient setting where the Acute MCS system procedure (e.g., CentriMag™ or PediMag™ Pumps) occurs. These services are restricted to the inpatient hospital site of service.

It is incumbent upon the physician to determine which, if any modifiers should be used first. A list of CPT[‡] code modifiers can be found at <https://www.cardiovascular.abbott/us/en/hcp/reimbursement/hf.html>

Effective Dates: January 1, 2021 - December 31, 2021

CODING AND REIMBURSEMENT FOR EXTRACORPOREAL MEMBRANE OXYGENATION

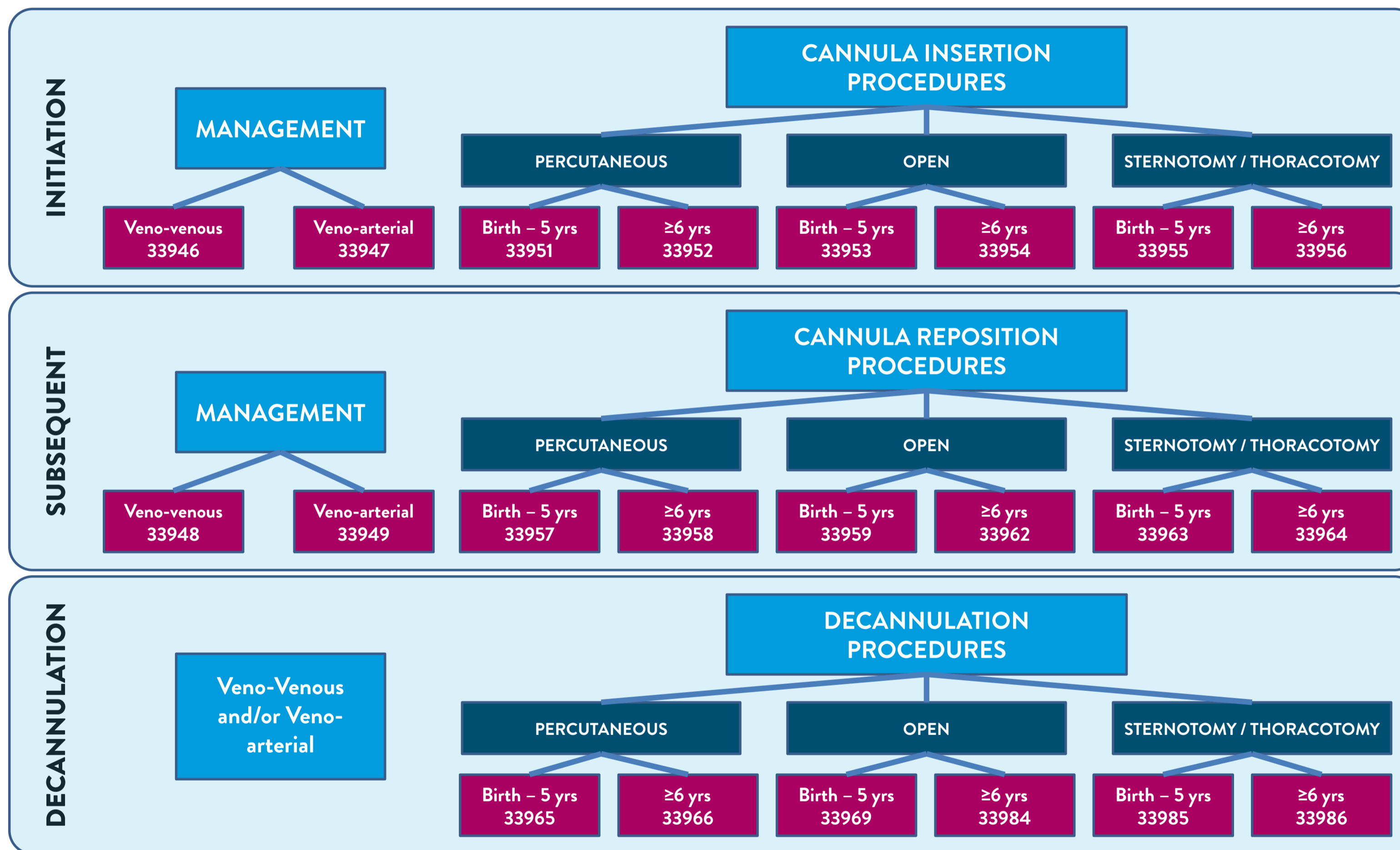


Diagram of scenarios obtained from CPT 2021

The CPT[®] codes above describe possible surgeon services in the hospital inpatient setting where the Acute MCS system procedure (e.g., CentriMag™ or PediMag™ Pumps) occurs. These services are restricted to the inpatient hospital site of service.

It is incumbent upon the physician to determine which, if any modifiers should be used first.

A list of CPT[®] code modifiers can be found at <https://www.cardiovascular.abbott/us/en/hcp/reimbursement/hf.html>

Effective Dates: January 1, 2021 - December 31, 2021

CODING AND REIMBURSEMENT FOR EXTRACORPOREAL MEMBRANE OXYGENATION

Scenarios illustrated below are examples provided by the CPT introductory language on ECMO support. This does not constitute coding guidance. It is important to verify clinical scenarios with your providers and coders.

CANNULA(E) REMOVED FROM ONE VESSEL AND NEW CANNULA(E) ARE PLACED IN A DIFFERENT VESSEL IN SUPPORT OF ECMO

CPT [‡] CODE	DESCRIPTION
CHOOSE CODES BASED UPON SUPPORT TYPE	
33965/33966/33969/33984/33985/33986	Cannula(e) removal*
33951/33952/33953/33954/33955/33956	Cannula(e) insertion*

REPLACEMENT OF CANNULA(E) IN SAME VESSEL IN SUPPORT OF ECMO

CPT [‡] CODE	DESCRIPTION
CHOOSE CODES BASED UPON SUPPORT TYPE	
33951/33952/33953/33954/33955/33956	Cannula(e) insertion*

*Codes subject to Multiple Procedure Guidelines. Highest valued procedure: 100%, Second, third, fourth, and fifth valued procedures: 50% Each procedure beyond the fifth: By report

The CPT[‡] codes above describe possible surgeon services in the hospital inpatient setting where the Acute MCS system procedure (e.g., CentriMag™ or PediMag™ Pumps) occurs. These services are restricted to the inpatient hospital site of service.

It is incumbent upon the physician to determine which, if any modifiers should be used first. A list of CPT[‡] code modifiers can be found <https://www.cardiovascular.abbott/us/en/hcp/reimbursement/hf.html>

Effective Dates: January 1, 2021 - December 31, 2021

CODING AND REIMBURSEMENT FOR EXTRACORPOREAL MEMBRANE OXYGENATION

Hospital Inpatient²

ICD-10-PCS CODE ⁴	DESCRIPTION	TYPICAL MS-DRG ASSIGNMENT	NATIONAL MEDICARE RATE
CHOOSE THE APPROPRIATE ICD-10 PROCEDURE CODE BASED ON CLINICAL TYPE			
5A1522F	Extracorporeal Oxygenation, Membrane, Central	003 ECMO	\$122,066
5A1522G	Extracorporeal Oxygenation, Membrane, Peripheral Veno-arterial		
5A1522H	Extracorporeal Oxygenation, Membrane, Peripheral Veno-venous		
INTRAOPERATIVE ECMO SUPPORT			
5A15A2F	Extracorporeal Oxygenation, Membrane, Central, Intraoperative	ECMO was in support of a surgical (O.R.) procedure and the primary surgical procedure drives DRG assignment	
5A15A2G	Extracorporeal Oxygenation, Membrane, Peripheral Veno-arterial, Intraoperative		
5A15A2H	Extracorporeal Oxygenation, Membrane, Peripheral Veno-venous, Intraoperative		

CODING AND REIMBURSEMENT FOR EXTRACORPOREAL MEMBRANE OXYGENATION

Hospital Inpatient²

Scenarios illustrated below are for example only. This does not constitute coding guidance. It is important to verify clinical scenarios with your providers and coders.

SCENARIO 1 : PATIENT IS PLACED ON ECMO AND TRANSFERRED TO ANOTHER HOSPITAL

Transferring Hospital	003 (Prorated)*
Receiving Hospital	003 (Full)

According to the CMS manuals, the transferring hospital receives a per diem, prorated from the expected MS-DRG. The per diem is derived from the MS-DRG's average length of stay when the transferring facility submits a claim to Medicare with the discharge status code of 02, "discharged/transferred to another short term general hospital for inpatient care." The geometric mean length of stay (LOS) and arithmetic mean LOS in FY2021 for MS-DRG 003 are 22.4 and 30.2 days, respectively.

The second hospital can expect full MS-DRG payment, even if the MS-DRG assignment turns out to be different from the transferring hospital. Hospital-specific factors-such as an ownership relations between the transferring and receiving hospital-could affect payment.

Refer to the CMS Hospital Manual language on "Transfers" in Chapter 3 Section 40.2.4 of the [CMS Claims Processing Manual](#).

SCENARIO 2: PATIENT SUPPORTED INTRAOPERATIVELY WITH ECMO FOR O.R. PROCEDURE

ICD-10-PCS CODE	DESCRIPTION	TYPICAL MS-DRG ASSIGNMENT
CHOOSE THE APPROPRIATE ICD-10 PROCEDURE CODE BASED ON CLINICAL TYPE		
Primary Surgical Code	Major surgical procedure done in concert with intraoperative ECMO	ECMO was in support of a surgical (O.R.) procedure and the primary surgical procedure drives DRG assignment
+		
5A15A2F	Extracorporeal Oxygenation, Membrane, Central, Intraoperative	
5A15A2G	Extracorporeal Oxygenation, Membrane, Peripheral Veno-arterial, Intraoperative	
5A15A2H	Extracorporeal Oxygenation, Membrane, Peripheral Veno-venous, Intraoperative	

Intraoperative ECMO procedures are designated as non-OR procedures. As such the MS DRG Assignment is driven by the primary surgical procedure.

CODING AND REIMBURSEMENT FOR EXTRACORPOREAL MEMBRANE OXYGENATION

ICD-10-CM Diagnosis Codes³

Diagnosis codes are used by both hospitals and physicians to document the medical necessity of the procedure. For Mechanical Circulatory Support patients, there are many possible diagnosis code scenarios and a wide variety of possible combinations. The limited diagnosis list is not meant to be an exhaustive representation of the diagnosis options for the procedure. It is always the responsibility of health care providers to choose the most appropriate diagnosis code(s) representative of the patient's clinical condition. The customer should check with their local carriers or intermediaries and should consult with legal counsel or a financial, coding or reimbursement specialist for coding, reimbursement or billing questions related to ICD-10CM diagnosis codes.

ICD-10-CM	DESCRIPTION	ICD-10-CM	DESCRIPTION
ICD CODES THAT MAY APPLY		ICD CODES THAT MAY APPLY	
I21.0 – I21.9	ST elevation (STEMI) and non-ST elevation (NSTEMI) myocardial infarction	T82.857	Stenosis of other cardiac prosthetic devices, implants and grafts
A41.8	Other sepsis	I71.0	Aortic aneurysm and dissection
I25.10 – I25.119	Atherosclerotic heart disease of native coronary artery	J84.11	Idiopathic interstitial pneumonia
I50.1 - I50.9	Heart failure	J84.10	Other interstitial pulmonary diseases with fibrosis
I34.0	Nonrheumatic mitral valve disorders	J96.0	Acute respiratory failure
I35.0	Nonrheumatic aortic valve disorders	J96.2	Acute and chronic respiratory failure
I47.0	Paroxysmal tachycardia	U07.1	COVID-19*

***ACUTE RESPIRATORY ILLNESS DUE TO COVID-19⁵**

On April 1, 2020 the CDC added a new ICD-10-CM code specifically for COVID-19 and guidance for reporting acute respiratory illnesses due to COVID-19 <https://www.cdc.gov/nchs/data/icd/COVID-19-guidelines-final.pdf>

Reimbursement information regarding the ID NOW™ COVID-19 Assay is available at: <https://www.codemap.com/alere/default.cfm?covid=y>

Effective Dates: October 1, 2020 – September 30, 2021

References

1. Physician Prospective Payment-Final rule with Comment Period and Final CY2021 Payment Rates. CMS-1734-F: <https://www.cms.gov/medicare/medicare-fee-service-payment/physicianfeeschedpfs-federal-regulation-notices/cms-1734-f>
2. Hospital Inpatient Prospective Payment-FY 2021 Final Rule Data Files CMS-1735-F and CMS-1735-CN: <https://www.cms.gov/medicare/acute-inpatient-pps/fy-2021-ipp-final-rule-home-page>
3. CMS 2021 ICD-10-CM: <https://www.cms.gov/medicare/icd-10/2021-icd-10-cm>
4. CMS 2021 ICD-10-PCS Procedure Coding System and Index: <https://www.cms.gov/medicare/icd-10/2021-icd-10-pcs>
5. ICD-10-CM Official Coding Guidelines for COVID-19 April 1, 2020 -September 30, 2020. <https://www.cdc.gov/nchs/data/icd/COVID-19-guidelines-final.pdf>

Important Safety Information**Rx Only**

Brief Summary: Prior to using these devices, please review the Instructions for Use for a complete listing of indications, contraindications, warnings, precautions, potential adverse events and directions for use.

CentriMag™ Circulatory Support System Indications [PMA Approval; 30-day use]: Temporary circulatory support for up to 30 days for one or both sides of the heart to treat post-cardiotomy patients who fail to wean from cardiopulmonary bypass, providing a bridge to decision when it is unclear whether the patient's heart will recover or whether the patient will need alternative, longer-term therapy.

CentriMag™ Circulatory Support System Contraindications [PMA Approval; 30-day use]: The CentriMag™ Circulatory Support System is contraindicated for use as a cardiomy suction device. The system is also contraindicated for patients who are unable or unwilling to be treated with an appropriate anticoagulant such as Heparin or a comparable alternative.

CentriMag™ Circulatory Support System Adverse Events [PMA Approval; 30-day use]: Adverse events that may be associated with mechanical circulatory support can include, but are not limited to, the following: bleeding on device support, hemolysis, infection, renal failure/dysfunction/complication, respiratory dysfunction, hepatic dysfunction, cardiac arrhythmias (atrial or ventricular), thromboembolism (venous and arterial non-CNS), hypotension, hypertension, device malfunction or failure, psychiatric events, right heart failure, and death.

Humanitarian Device Statement: Caution: Humanitarian Device. The CentriMag Circulatory Support System is authorized by Federal Law for temporary circulatory support for up to 30 days for patients in cardiogenic shock due to right ventricular failure. The effectiveness of this device for this use has not been demonstrated.

CentriMag™ RVAS Indications [Humanitarian Exemption Device (HDE) Approval; 30-day use]: The CentriMag Circulatory Support System is intended to provide temporary circulatory support for up to 30 days for patients in cardiogenic shock due to acute right ventricular failure.

CentriMag™ RVAS Contraindications [Humanitarian Exemption Device (HDE) Approval; 30-day use]: The CentriMag Circulatory Support System is contraindicated for use as a cardiomy suction device. The system is also contraindicated for patients who are unable or unwilling to be treated with an appropriate anticoagulant such as Heparin or a comparable alternative.

CentriMag™ Acute Circulatory Support System Temporary Expanded Indication: The FDA issued an enforcement policy guidance document in April 2020 allowing for FDA-cleared or approved cardiopulmonary bypass devices to be used in an ECMO circuit to treat patients who are experiencing acute respiratory failure and/or acute cardiopulmonary failure during the COVID-19 public health emergency. The CentriMag™ System including the CentriMag™ Blood Pump and PediMag™ Blood Pump are indicated for use as part of an ECMO circuit for longer than 6 hours to treat patients with acute respiratory failure and/or acute cardiopulmonary failure.

CentriMag™ Blood Pump Indications [510(k) Clearance; 6-hour use]: The CentriMag Circulatory Support System is indicated to pump blood through the extracorporeal bypass circuit for extracorporeal circulatory support for periods appropriate to cardiopulmonary bypass (up to six hours). It is also indicated for use in extracorporeal support systems (for periods up to six hours) not requiring complete cardiopulmonary bypass (e.g. valvuloplasty, circulatory support during mitral valve reoperation, surgery of the vena cava or aorta, liver transplants etc.).

CentriMag™ Blood Pump Contraindications [510(k) Clearance; 6-hour use]: The CentriMag Circulatory Support System is contraindicated for use as a cardiomy suction device. The system is also contraindicated for patients who are unable or unwilling to be treated with an appropriate anticoagulant such as Heparin or a comparable alternative.

PediMag™ Blood Pump Indications for Use [510(k) Clearance; 6-hour use]: The PediMag Blood Pump is indicated for use with the CentriMag Circulatory Support System console and motor to pump blood through the extracorporeal bypass circuit for extracorporeal circulatory support for periods appropriate to cardiopulmonary bypass (up to six hours) for surgical procedures such as mitral valve reoperation. It is also indicated for use in extracorporeal support systems (for periods up to six hours) not requiring complete cardiopulmonary bypass (e.g. valvuloplasty, circulatory support during mitral valve reoperation, surgery of the vena cava or aorta, liver transplants etc.).

PediMag™ Blood Pump Contraindications [510(k) Clearance; 6-hour use]: The PediMag Blood Pump is contraindicated for use as a cardiomy suction device. The CentriMag Circulatory Support System is contraindicated for use as a cardiomy suction device. The system is also contraindicated for patients who are unable or unwilling to be treated with an appropriate anticoagulant such as Heparin or a comparable alternative.

***PMA approval for 30-day use of CentriMag™ System components include:** CentriMag™ Pump, CentriMag™ Console, CentriMag™ Motor, Mag Monitor, Flow Probe, and CentriMag™ Drainage Cannula and CentriMag™ Return Cannula.

Optional accessories include: CentriMag™ System Cart, CentriMag™ System Transporter and Pressure Transducer. **PMA approval for 30-day use of CentriMag™ System excludes:** PediMag™ Blood Pump and any other pediatric components or accessories.

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