

# Intermacs Implant

Implant Date

## Durable Implantable VAD Support

Device type

- ☐ LVAD
- ☐ RVAD
- ☐ Both (LVAD + RVAD in the same OR visit)
- ☐ Total Artificial Heart

Please remember to fill out the RHF adverse event form

Approach to insertion

- ☐ Full Sternotomy
- ☐ Right thoracotomy only
- ☐ Percutaneous
- ☐ Left subcostal
- ☐ Right subcostal
- ☐ Left Thoracotomy only
- ☐ Bilateral Thoracotomy
- ☐ Axillary (cut down)
- ☐ Left Thoracotomy plus Mini Sternotomy
- ☐ Left Thoracotomy to Right Mini Sternotomy
- ☐ Unknown
- ☐ Other, specify

LVAD device brand

- ☐ HeartMate IP
- ☐ HeartMate VE
- ☐ Novacor PC
- ☐ Novacor PCq
- ☐ HeartMate XVE
- ☐ Thoratec IVAD
- ☐ Medtronic HVAD
- ☐ Berlin Heart EXCOR (paracorporeal)
- ☐ Micromed DeBakey VAD - Child
- ☐ Thoratec PVAD
- ☐ HeartMate II LVAS
- ☐ HeartMate III
- ☐ Durable Implantable: Other, Specify
- ☐ Abiomed BVS 5000
- ☐ Abiomed AB5000
- ☐ TandemHeart
- ☐ Thoratec Centrimag (Levitronix)
- ☐ Sorin Revolution
- ☐ Abiomed Impella CP
- ☐ Abiomed Impella 2.5
- ☐ Abiomed Impella 5.0
- ☐ Abiomed Impella RP
- ☐ Abiomed Impella 5.5
- ☐ Temporary: Other, Specify

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**Temporary: Other, specify:**

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**LVAD: Serial Number**ST: ☐ Unknown

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**LVAD: cannulae location-inflow**

- ☐ Left ventricle, Apex  
☐ Left ventricle, Diaphragmatic surface  
☐ Left atrium, Interatrial groove  
☐ Left atrium, Left atrial appendage  
☐ Left Atrium, Dome Left Atrium  
☐ Right Atrium (Option for Adult Congenital Cases)  
☐ Right Ventricle (Option for Adult Congenital Cases)  
☐ Unknown  
☐ Other, specify

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**LVAD: cannulae location-outflow**

- ☐ Ascending aorta  
☐ Descending thoracic aorta  
☐ Abdominal aorta  
☐ Left subclavian artery  
☐ Right subclavian artery  
☐ Unknown  
☐ Other, Specify

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**RVAD device brand**

- ☐ Thoratec IVAD  
☐ Medtronic HVAD  
☐ Berlin Heart EXCOR (paracorporeal)  
☐ Thoratec PVAD  
☐ HeartMate III  
☐ Durable Implantable: Other, Specify  
☐ Abiomed BVS 5000  
☐ Biomedicus  
☐ Abiomed AB5000  
☐ TandemHeart  
☐ Thoratec Centrimag (Levitronix)  
☐ Sorin Revolution  
☐ Abiomed Impella CP  
☐ Abiomed Impella 2.5  
☐ Abiomed Impella 5.0  
☐ Abiomed Impella RP  
☐ Abiomed Impella 5.5  
☐ Temporary: Other, Specify

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**RVAD, Temporary: Other, specify:**

**RVAD: Approach to insertion**

- ☐ Full Sternotomy
- ☐ Right thoracotomy only
- ☐ Percutaneous
- ☐ Left subcostal
- ☐ Right subcostal
- ☐ Left Thoracotomy only
- ☐ Bilateral Thoracotomy
- ☐ Axillary (cut down)
- ☐ Left Thoracotomy plus Mini Sternotomy
- ☐ Left Thoracotomy to Right Mini Sternotomy
- ☐ Unknown
- ☐ Other, specify

**RVAD: Serial Number**ST: ☐ Unknown**RVAD: cannulae location-inflow**

- ☐ Right atrium
- ☐ Right ventricle
- ☐ Left Atrium (option for adult congenital cases)
- ☐ Left Ventricle (option for adult congenital cases)
- ☐ Unknown
- ☐ Other, Specify

**RVAD: cannulae location-outflow**

- ☐ MPA (main pulmonary artery)
- ☐ LPA (left pulmonary artery)
- ☐ RPA (right pulmonary artery)
- ☐ Aorta
- ☐ Conduit
- ☐ Unknown
- ☐ Other, Specify

**TAH device brand**

- ☐ SynCardia TAH - 50cc
- ☐ SynCardia TAH - 70cc
- ☐ AbioCor TAH
- ☐ Other, Specify

**TAH: Serial Number**ST: ☐ Unknown**Anticipated need for RVAD**

- ☐ Planned (decision for insertion made prior to surgical incision)
- ☐ Unplanned (unanticipated complication)
- ☐ Unknown

**The association of the right heart failure event should be classified as:**

- ☐ Patient related e.g., pre-implant right heart failure, volume overload secondary to non-adherence with medical management, severe aortic

regurgitation, cardiorenal syndrome, arrhythmia induced, pulmonary disease, elevated pulmonary vascular resistance

- ☐ **Management related** e.g., related to implant surgery, volume overload, inotropic agent withdrawal
- ☐ **Device related** e.g., associated with Pump malfunction, outflow graft compromise
- ☐ **No association identified**

### Associated findings

Surgical observations or Intraoperative TEE

- ☐ PFO / ASD
- ☐ Aortic Insufficiency
- ☐ Mitral insufficiency
- ☐ Tricuspid Insufficiency
- ☐ None

### Aortic Insufficiency

- ☐ Mild
- ☐ Moderate
- ☐ Severe

### Mitral Insufficiency

- ☐ Mild
- ☐ Moderate
- ☐ Severe

### Tricuspid Insufficiency

- ☐ Mild
- ☐ Moderate
- ☐ Severe

**Is the VAD implant occurring in the setting of a failed cardiac operation (same operation or hospitalization)?**

- ☐ Yes
- ☐ No

### If yes, select an indication

- ☐ Failure to wean from Cardio Pulmonary Bypass
- ☐ Failure to Wean from ECMO
- ☐ Persistent heart failure following cardiac surgery (same hospitalization)

Enter cardiac operation:

- ☐ None

### Concomitant surgery

Planned or accompanying LVAD procedure

- ☐ None
- ☐ ASD closure
- ☐ PFO closure
- ☐ CABG
- ☐ VSD closure
- ☐ Congenital cardiac surgery, other
- ☐ Aortic Valve Procedure
- ☐ Aortic Valve Surgery - Replacement - Biological
- ☐ Aortic Valve Surgery - Replacement - Mechanical
- ☐ Mitral Valve Surgery - Repair
- ☐ Mitral Valve Surgery - Replacement - Biological
- ☐ Mitral Valve Surgery - Replacement - Mechanical
- ☐ Tricuspid Valve Surgery - Repair - DeVega
- ☐ Tricuspid Valve Surgery - Repair - Ring
- ☐ Tricuspid Valve Surgery - Repair - Other
- ☐ Tricuspid Valve Surgery - Replacement - Biological
- ☐ Tricuspid Valve Surgery - Replacement - Mechanical
- ☐ Tricuspid Valve Surgery - Excision
- ☐ Pulmonary Valve Surgery - Repair
- ☐ Pulmonary Valve Surgery - Replacement - Biological
- ☐ Pulmonary Valve Surgery - Replacement - Mechanical
- ☐ Left ventricular aneurysmectomy
- ☐ Other, specify

- ☐ Arrhythmia surgery (ablation)
- ☐ Ligation of left atrial appendage
- ☐ Temporary MCS Removal (ECMO, IABP removal documented here)
- ☐ Extracorporeal Membrane Oxygenation (ECMO Insertion)

**Indication for CABG**

- ☐ Planned (decision for CABG made prior to skin incision)
- ☐ Unplanned (unanticipated complication)
- ☐ Unknown

**Territories revascularized**

- ☐ RCA
- ☐ LAD
- ☐ Circumflex
- ☐ Unknown

**Aortic Valve Procedure**

- ☐ Full (annular patch or complete leaflet closure)
- ☐ Partial leaflet closure (Park Stitch or plication leaflet tips only)
- ☐ Unknown

**Mitral Valve Repair**

Select all that apply

- ☐ Annuloplasty
- ☐ Alfieri stitch
- ☐ Unknown

**Annuloplasty**

- ☐ Complete ring
- ☐ Partial band
- ☐ Unknown

**Annuloplasty - Size** mmST: ☐ Unknown**Arrhythmia surgery (ablation)**

- ☐ Ventricular
- ☐ Atrial
- ☐ Unknown

**Atrial**

Select all that apply

- ☐ Left-sided
- ☐ Right-sided
- ☐ Unknown

**Left-sided**

Select one

- ☐ Pulmonary vein isolation only
- ☐ Complete left sided lesion set (Maze procedure)
- ☐ Unknown

**Ligation of left atrial appendage**

Select one

- ☐ Surgical device (e.g., AtriClip)
- ☐ Oversew and or staple
- ☐ Excision
- ☐ Unknown

**Temporary MCS Removal**

Select all that apply

- ☐ ECMO decannulation
- ☐ IABP
- ☐ RVAD, Temporary
- ☐ LVAD, Temporary
- ☐ Other, specify

**Temporary RVAD Brand**

Select one

- ☐ Abiomed BVS 5000
- ☐ Biomedicus

- ☐ Abiomed AB5000
- ☐ TandemHeart
- ☐ Thoratec Centrimag (Levitronix)
- ☐ Sorin Revolution
- ☐ Abiomed Impella CP
- ☐ Abiomed Impella 2.5
- ☐ Abiomed Impella 5.0
- ☐ Abiomed Impella RP
- ☐ Abiomed Impella 5.5
- ☐ Temporary: Other, Specify

**Temporary LVAD Brand**

Select one

- ☐ Abiomed BVS 5000
- ☐ Abiomed AB5000
- ☐ TandemHeart
- ☐ Thoratec Centrimag (Levitronix)
- ☐ Sorin Revolution
- ☐ Abiomed Impella CP
- ☐ Abiomed Impella 2.5
- ☐ Abiomed Impella 5.0
- ☐ Abiomed Impella RP
- ☐ Abiomed Impella 5.5
- ☐ Temporary: Other, Specify

**Extracorporeal membrane oxygenation**

- ☐ Veno-venous (VV) ECMO
- ☐ Veno-arterial (VA) ECMO
- ☐ Unknown

**Outflow**

- ☐ Femoral artery
- ☐ Ascending aorta
- ☐ Descending thoracic aorta
- ☐ MPA (main pulmonary artery)
- ☐ LPA (left pulmonary artery)
- ☐ RPA (right pulmonary artery)
- ☐ Conduit
- ☐ Left subclavian artery
- ☐ Right subclavian artery
- ☐ Femoral (percutaneous)
- ☐ Femoral (cut down)
- ☐ Unknown
- ☐ Other, Specify

**Inflow**

- ☐ Femoral vein
- ☐ Left atrium, Left atrial appendage
- ☐ Left atrium, Interatrial groove
- ☐ Left ventricle, Apex
- ☐ Left ventricle, Diaphragmatic surface
- ☐ Left atrium, Dome left atrium
- ☐ Right atrium
- ☐ Right ventricle
- ☐ Femoral (percutaneous)
- ☐ Femoral (cut down)
- ☐ Unknown
- ☐ Other, Specify

**Was the patient put on Cardiopulmonary Bypass Pump?**

- ☐ Yes  
☐ No

**CPB Time**

Enter total cardiopulmonary bypass time

minutes

- ST: ☐ Unknown  
☐ Not Done

**Was an aortic cross clamp used?**

- ☐ Yes  
☐ No  
☐ Unknown

**Enter duration of the aortic cross clamp time in minutes**

minutes

- ST: ☐ Unknown  
☐ Not Done

**Temperature:**

Lowest body temperature during cardiopulmonary bypass

- ☐ Normothermia (37°C)  
☐ Mild hypothermia (32 to <37°C)  
☐ Deep hypothermia (<32°C)  
☐ Not done

**Lowest Hematocrit on pump:**

%

- ST: ☐ Unknown

**Highest serum arterial lactate on pump:**

mmol/L

- ST: ☐ Unknown

**Surgery Time**

Enter total surgery time from primary incision to closure

minutes

- ST: ☐ Unknown

**Status of incision at end of procedure**

Select one

- ☐ Open (i.e., delayed sternal closure)  
☐ Closed  
☐ Unknown

## Additional Operative Details

**Was left ventricular thrombus present at operation?**

If you select Yes, you are confirming that the left ventricular thrombus was removed.

- ☐ Yes  
☐ No  
☐ Unknown

**Was left atrial appendage clot present at operation?**

- ☐ Yes  
☐ No  
☐ Unknown

**Was the left atrial appendage clot removed?**

- ☐ Yes  
☐ No  
☐ Unknown

**Was palpable atherosclerotic plaque or calcified plaque present in the ascending**

- ☐ Yes  
☐ No  
☐ Unknown

aorta or aortic arch at operation?

☐ Did not evaluate

Did the presence of palpable atherosclerotic plaque or calcified plaque change operative plans?

☐ Yes  
☐ No  
☐ Unknown

Was a patent foramen ovale present at operation?

☐ Yes  
☐ No  
☐ Unknown

Was the patent foramen ovale closed?

☐ Yes  
☐ No  
☐ Unknown

Were traction/stabilization sutures utilized to optimize (inlet cannula) LVAD pump position?

☐ Yes  
☐ No  
☐ Unknown

Which deairing techniques were utilized at device implantation?

Select all that apply

☐ None  
☐ Use of CO2 to flood the operative field  
☐ Needle evacuation of air from the outflow graft  
☐ Aortic root vent  
☐ Left ventricular vent (Right superior pulmonary vein)  
☐ Unknown  
☐ Other, specify

Was the LVAD procedure complicated by vasoplegia (MAP <60 mmHg requiring > 1 vasopressor to treat or unexpected ECMO) during or following cardiopulmonary bypass in the operating room?

☐ Yes  
☐ No  
☐ Unknown  
☐ Not Applicable

## Implant Hemodynamics

(At the start of procedure following induction of anesthesia but prior to skin incision):

Heart rate

beats per min

ST: ☐ Unknown  
☐ Not done

Systolic blood pressure

(millimeters of mercury) should be determined from auscultation or arterial line if necessary.

mmHg

ST: ☐ Unknown  
☐ Not done

Diastolic blood pressure

(millimeters of mercury) should be determined from auscultation or arterial line if necessary

mmHg

ST: ☐ Unknown  
☐ Not done

Mean arterial blood pressure

mmHg

ST: ☐ Unknown  
☐ Not done  
☐ Not applicable



**Pulmonary artery systolic pressure** mmHgST: ☐ Unknown☐ Not done**Pulmonary artery diastolic pressure** mmHgST: ☐ Unknown☐ Not done**Mean Pulmonary Artery Capillary Wedge Pressure** mmHgST: ☐ Unknown☐ Not done**Central Venous Pressure (CVP) or Right Atrial Pressure** mmHgST: ☐ Unknown☐ Not done**Cardiac Index** L/min/M2 (by Swan)ST: ☐ Unknown☐ Not done**Was Cardiac Index Measured by Fick or Thermodilution?**☐ Yes☐ No☐ Unknown**Choose Method**☐ Fick☐ Thermodilution**Cardiac output** L/minST: ☐ Unknown☐ Not done**Was Cardiac Output Measured by Fick or Thermodilution?**☐ Yes☐ No☐ Unknown**Choose Method**☐ Fick☐ Thermodilution

## Intraoperative Transfusions

Intraoperative transfusions are not counted as a major bleeding event

**Were intraoperative blood products or clotting factors given to treat bleeding/coagulopathy?**☐ Yes☐ No☐ Unknown**Check any transfusions or clotting factor replacements administered:**☐ Packed RBC☐ Prothrombin Complex concentrate☐ Factor VII☐ Platelets☐ Cryoprecipitate☐ Fresh frozen plasma☐ Other

☐ Unknown

Number of packed RBC units:

ST: ☐ Unknown

Number of platelet units:

ST: ☐ Unknown

Number of fresh frozen plasma units:

ST: ☐ Unknown

Number of cryoprecipitate units:

ST: ☐ Unknown