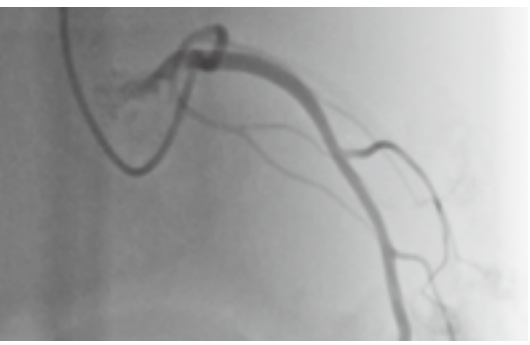
www.heartroid.com

CE

HEARTROID®

Cardiac Catheterization Simulator



Do practice not on a patient but ...

“HEARTROID”

“HEARTROID” is a catheterization simulator offering procedural trainig opportunities for physicians and medical students.

Imaging-compatible

Practical training under X-ray fluoroscopy and echocardiography

Easy-to-setup

Ready-to-use in just a few minutes without any technical knowledge

Portable

Inflight carry-on baggage compatible

Any situation

In the cath lab, office, conference hands-on and anywhere

HEARTROID® PROJECT

Cardiac Catheterization Simulator

HEARTROID®

HEARTROID System

Heart model + Special Tank + Pulsatile Pump

Just pour water and connect with the Pump

"HEARTROID" is a training system with a model and a pulsatile pump for physicians and medical students. This system offers realistic clinical images under multiple imaging modalities in the clinical scene, with a short prep time.

How to Set UP

Reading QR cord, you can find the movie "How to set up".

Coronary

TAVI

Components

Model

3D-printed models to practice cardiovascular, electrophysiological and neurovascular procedures. Can be ustomized up to request.

Smart Tank

Transparent tank that provides high visibility and usability for simulation training using camera and imaging modalities like X-ray fluoroscopy, echocardiography and EP mapping systems.

Pulsatile Pump

Our uniquely-developed pulsatile pump can be set by 30-120 bpm (1200-4800ml/min in flow volume). Realistic clinical images are obtained by particular patterns of the cylinder movement.

Hose

Hose with one-touch joint.

Sheath

Special tubes with sheath.

Lubricant

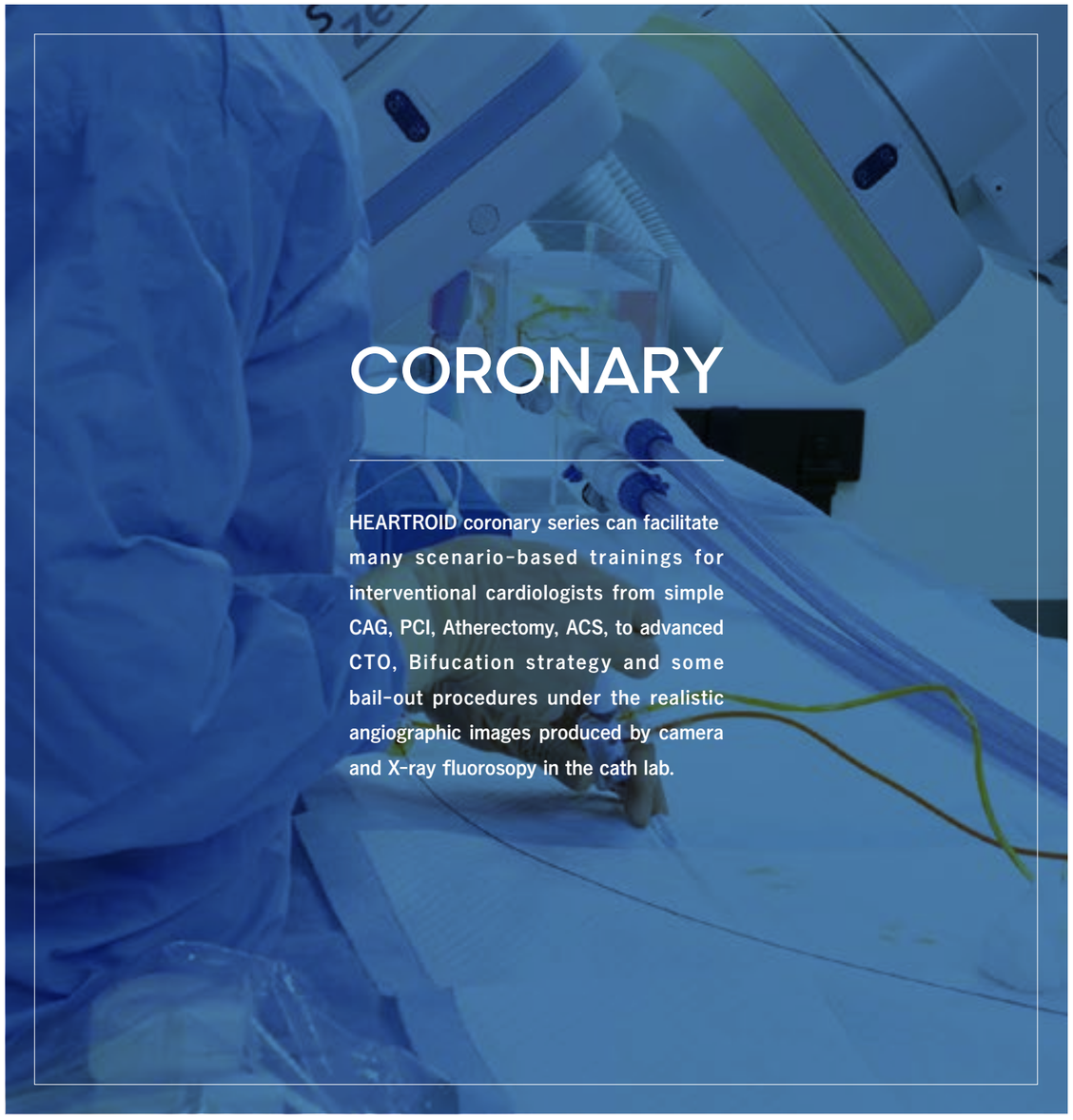
Special lubricant for coating the inner surface of tmodels. I fl. oz.
(lasts for 20 coatings)

Camera Set

A compact camera with a flexible arm that can provide clear images from various angles.

Carry Case

Capable of containing the components and special table.



CORONARY

HEARTROID coronary series can facilitate many scenario-based trainings for interventional cardiologists from simple CAG, PCI, Atherectomy, ACS, to advanced CTO, Bifucation strategy and some bail-out procedures under the realistic angiographic images produced by camera and X-ray fluorosopy in the cath lab.

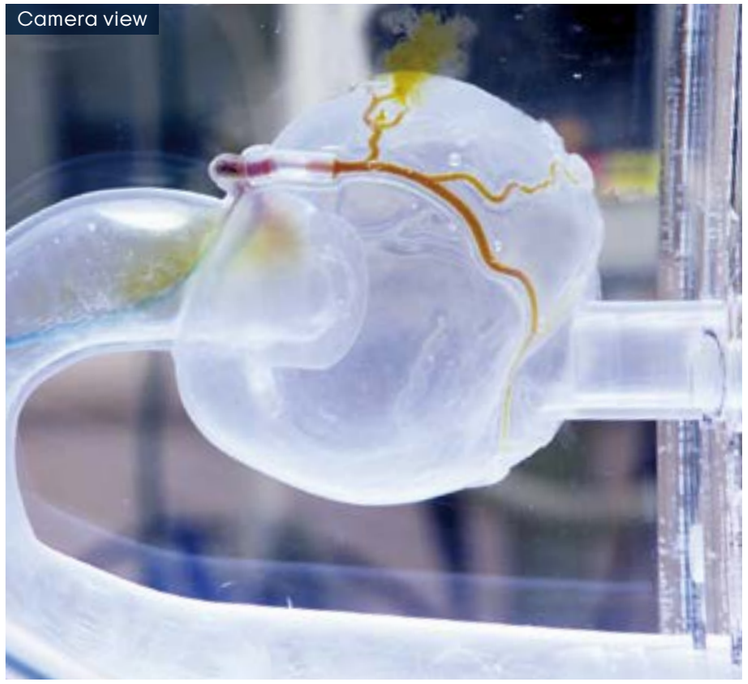
Coronary Model

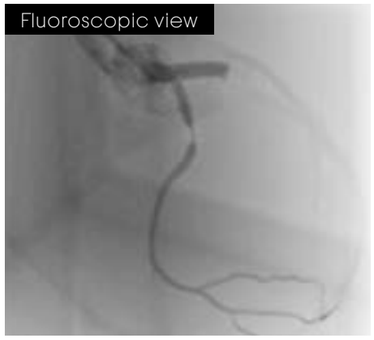
PCI Model

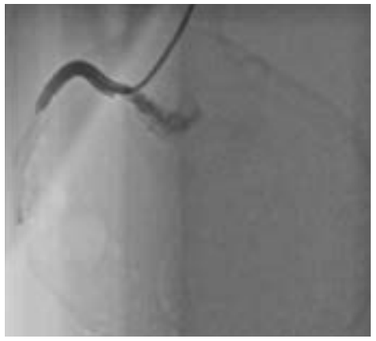
Compatible Procedure

CAG	CABG	ACS	IVUS/OCT	FFR	Stent	Atherectomy
IVL	DCA	Bifurcation		CTO	Rupture	Coiling

Web





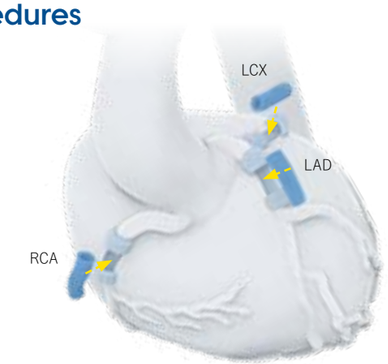


This model allows trainees to understand the strategy behind dealing with various lesions, especially severe calcification. With calcified vessel parts, one can practice the debulking technique with Directional Coronary Atherectomy (DCA) devices.

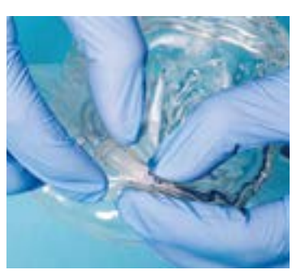
Replaceable “Lesion parts” according to the procedures

HEARTROID Coronary series have sockets for attaching “Lesion parts”(except for CAG model). You can perform various training by replacing the “Lesion parts” according to the purpose.

See p.11 in details ▶



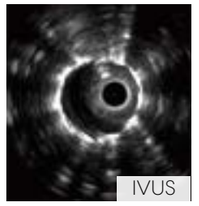
Easy to set up

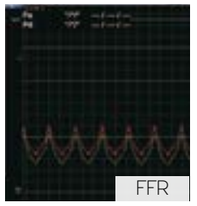


Recommended procedures

Stenting (Simple PCI procedure)

With “Soft Plaque” parts ▶ See p.11





This scenario shows a simple PCI; that is balloon dilatation followed by stent deployment. Imaging catheters (IVUS, OCT, Angioscopy) and FFR are also applicable. Training under X-ray fluoroscopy is more beneficial.

Atherectomy (Debulking procedures)

With “Calc” parts ▶ See p.11

This scenario allows trainees to understand the strategy behind dealing with various lesions, especially severe calcification. With calcified vessel parts, one can practice the debulking technique with Rotablator and Directional Coronary Atherectomy (DCA) devices. Training under X-ray fluoroscopy is more beneficial.

Rotablation with HEARTROID

ACS (Thrombectomy, balloon and stenting, Laser ablation)

With “ACS” parts ▶ See p.11

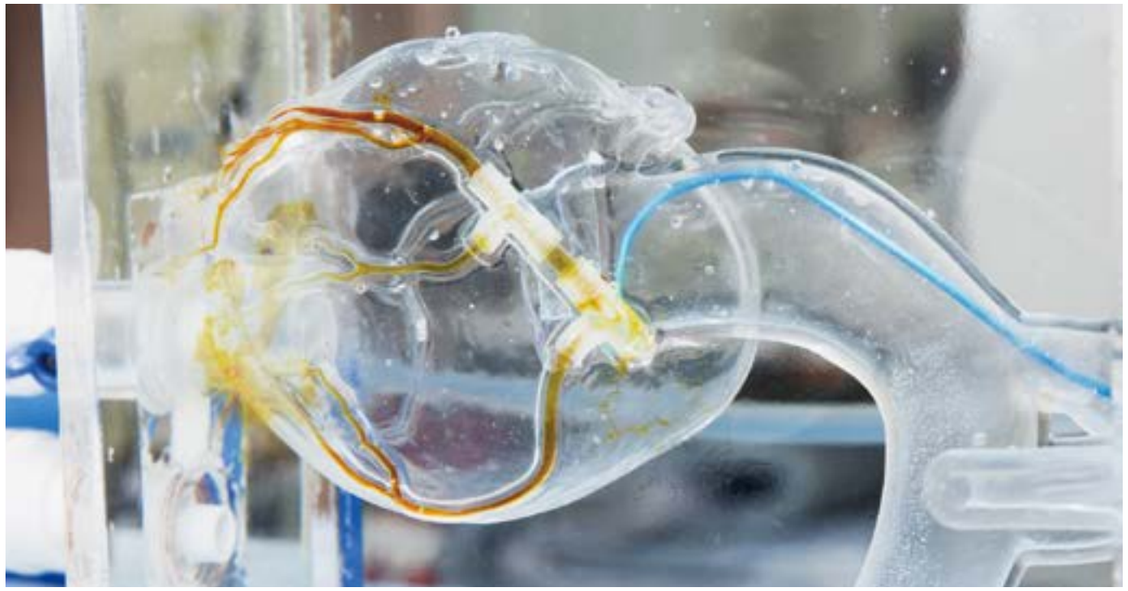
This scenario facilitates emergent PCI strategy including laser ablation and/or thrombectomy followed by balloon dilatation and stent deployment. In successful case, you can see some thrombus in a syringe along with a nice final angiography.

BIF Model

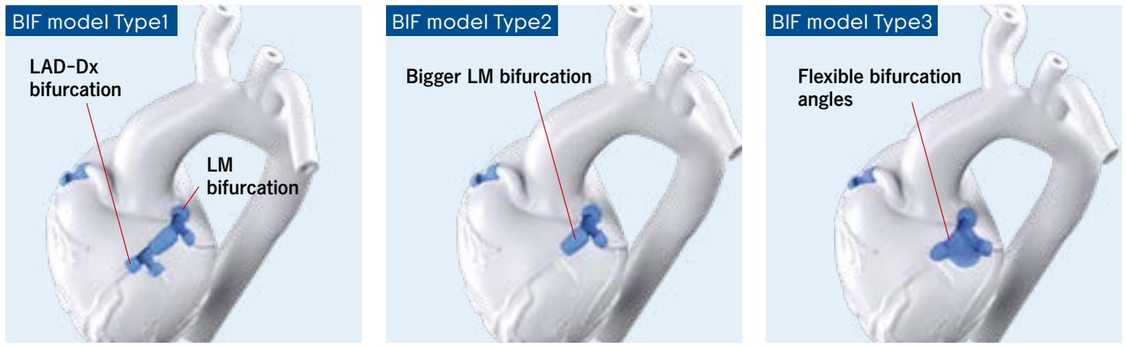
Compatible Procedure

CAG	CABG	ACS	IVUS/OCT	FFR	Stent	Atherectomy
IVL	DCA	Bifurcation		CTO	Rupture	Coiling

Web

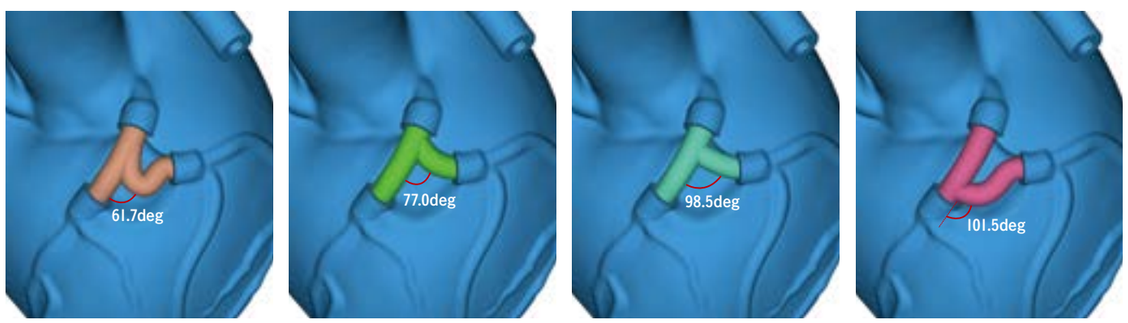


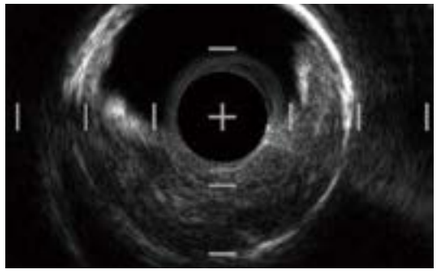
BIF model can facilitates the full procedures around LM (left main) bifurcation and LAD-Dx (diagonal branch) bifucarion strategies. Let's try T-stenting, Culotte, Crush, KBT and whatever you want!



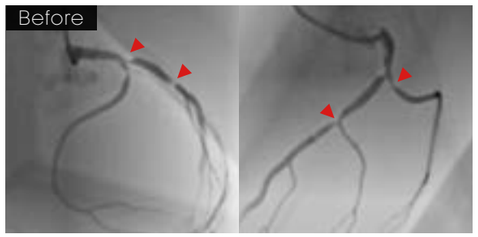
See the pictures below ▼

Flexibility in bifurcation angles

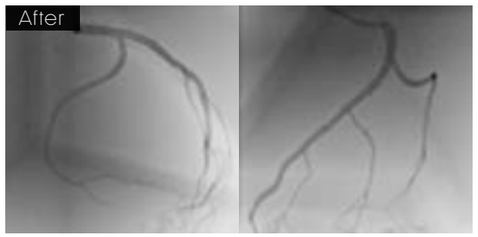




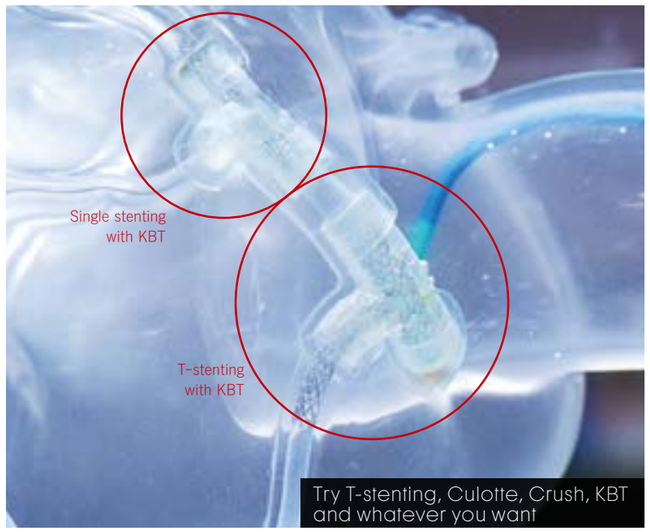
IVUS image of Coronary plaque in DCA parts



RAO CAUDCA parts RAO CAUDCA parts

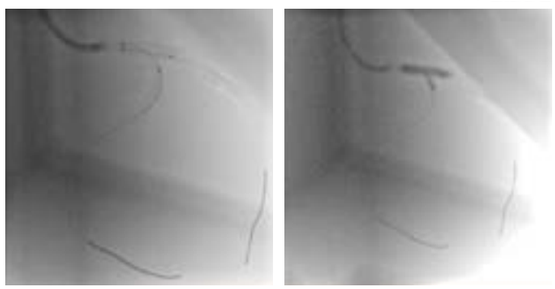


RAO CAUDCA parts RAO CAUDCA parts

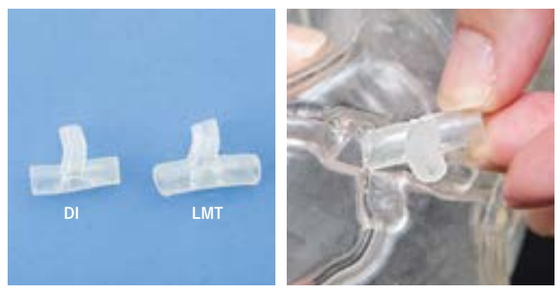


KBT (Kissing balloon technique)

KBT & POT with HEARTROID



BIF lesion parts (detachable & disporsable)

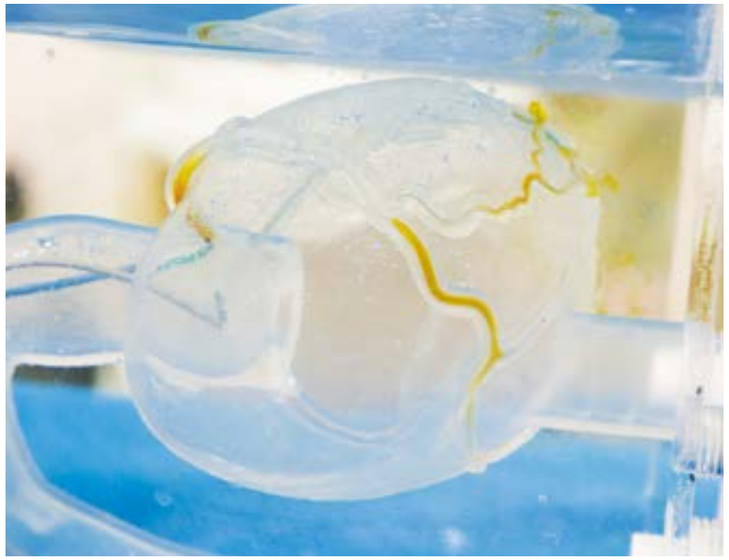


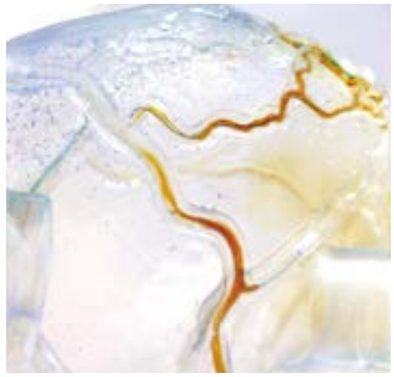
CTO Model

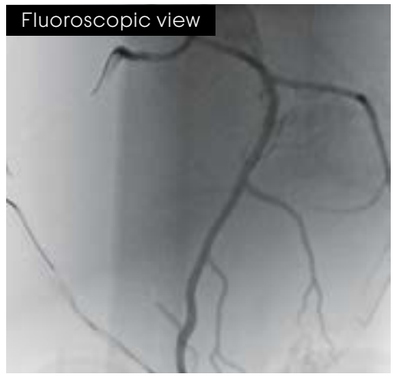
Compatible Procedure

CAG	CABG	ACS	IVUS/OCT	FFR	Stent	Atherectomy
IVL	DCA	Bifurcation		CTO	Rupture	Coiling

Web

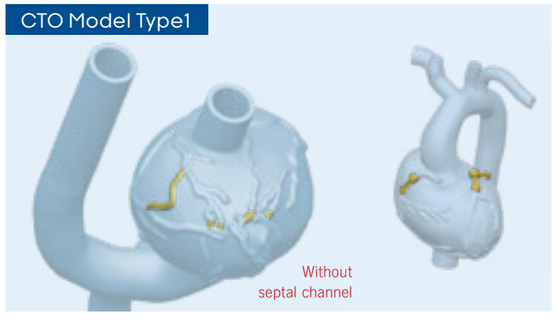


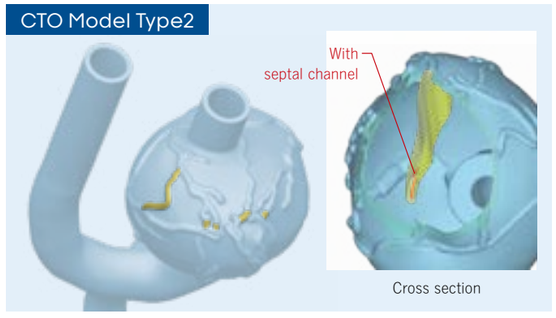




This is a chronic total occlusion (CTO) disease model. It features multiple collateral channels between LAD and RCA (including septal branch and apex routes), and between LCX and RCA (including AV groove and apex routes). The LAD, LCX and RCA have their own pockets, so that if the CTO vessel part is set in the RCA pocket, both the antegrade approach from RCA and the retrograde approach from LAD can be simulated, and vice versa.

CTO Model lineup





See p.11 in details ▶

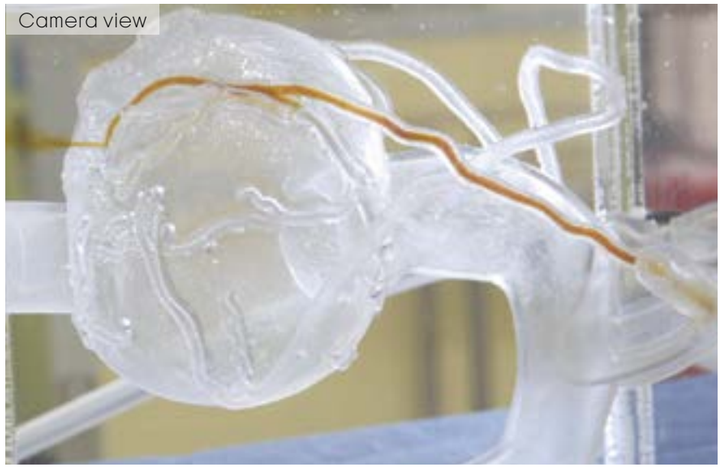
The standard model includes one lesion proximal to each of LAD, LCX and RCA. For the collateral vessels, the apex and AV groove routes are available for Type I, and the septal branch route for Type 2. By changing the position of the detachable coronary artery parts, the occluded vessel can be selected. For example, when CTO lesion part can be placed proximal to RCA, then an antegrade approach can be attempted from RCA side, followed by a retrograde approach from LAD side and vice versa.

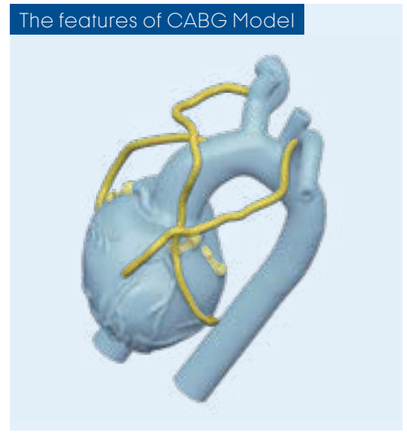
CABG Model

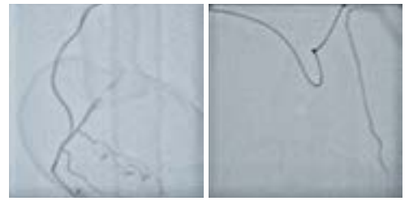
Compatible Procedure

CAG	CABG	ACS	IVUS/OCT	FFR	Stent	Atherectomy
IVL	DCA	Bifurcation		CTO	Rupture	Coiling

Web







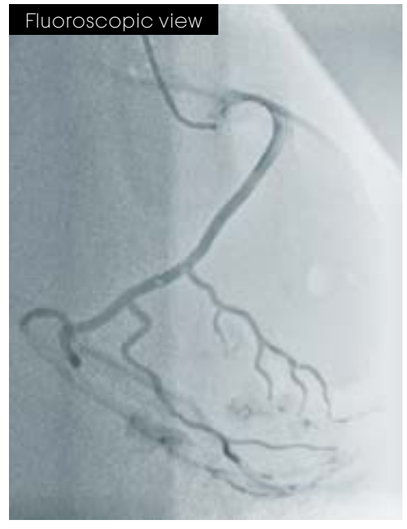
This is a triple vessel disease model with a triple coronary artery bypass grafting(CABG) : LITA–mid LAD, RITA–LCX OM branch, and distal RCA. The native coronary artery has a severe stenosis in the proximal LAD, a severe stenosis in the proximal LCX, and also a severe stenosis in the mid RCA. This model is suitable for bypass graft angiography and PCI simulation for cases involving CABG.

CAG Model

Compatible Procedure

CAG	CABG	ACS	IVUS/OCT	FFR	Stent	Atherectomy
IVL	DCA	Bifurcation		CTO	Rupture	Coiling

Web



This system facilitates full procedures necessary in CAG (coronary angiography). It allows trainees to understand how to manipulate catheters, guidewires and contrast injectionunder camera and X-ray fluoroscopic view. Both transfemoral and transradial approach compatible. This entry model is suitable for young cardiologists, medical students and cath lab staffs' team simulation.

Lesion parts (Detachable & Disporsable)

The legion parts are easy to change, for a quick reset.

Normal

75% stenosis with soft plaque suitable for direct stenting

Soft plaque

75% stenosis with soft plaque suitable for direct stenting

ACS

100% total occlusion easy to pass

CTO

Only for CTO model

100% total occlusion. (Hardness: level 1 to 5)

Concentric Calc

75% stenosis with concentric calcification suitable for Atherectomy(1.0mm, 1.25mm, 1.5mm, 1.75mm)

Eccentric Calc

75% stenosis with eccentric calcification suitable for Atherectomy(1.0mm, 1.25mm, 1.5mm, 1.75mm)

IVL

75% stenosis with concentric calcification suitable for IVL

Rupture

For bail-out scenario "Coronary Rupture"

Normal BIF

Suitable for stenting under camera view

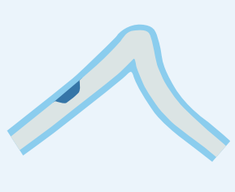
BIF soft plaque

Suitable for stenting under X-ray

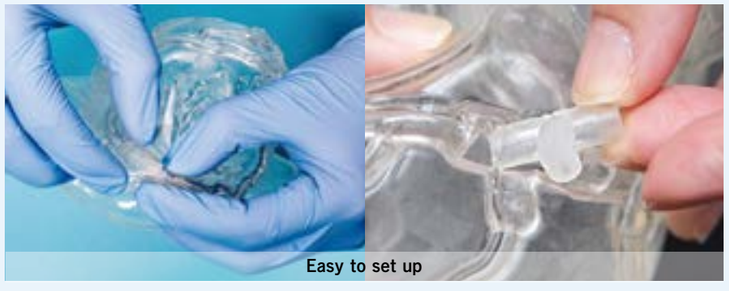
BIF calcification

Calcified lesion for both camera and X-ray

DCA



IVUS-visible soft plaque suitable for DCA



Easy to set up

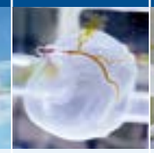
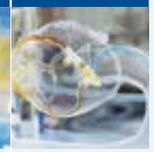
Stenosis

Concentric Calc

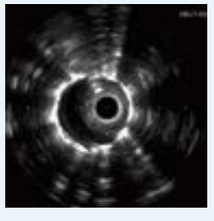
IVL

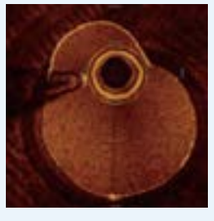
CTO

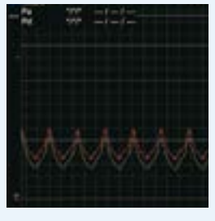
Compatible procedures

Model	CAG	PCI	CABG	CTO	BIF
					
Coronary angiography (CAG)	○	○	○	○	○
PCI/CAG for CABG			○		
Thrombectomy / ELCA for ACS		○	○	○	
IVUS / OCT imaging		○	○	○	○
Fractal Flow Reserve (FFR)		○	○	○	○
Stent deployment		○	○	○	○
Atherectomy (Rotablation/OA)		○	○	○	○
Intravascular Lithotripsy (IVL)		○	○	○	○
Directional coronary atherectomy (DCA)					○
Bifurcation procedure KBT/Culotte & Crush stenting					○
Chronic total occlusion (CTO)				○	
Coronary rupture (covered stent)		○	○	○	○*
Coiling for coronary perforation	○	○	○	○	○

* for RCA only





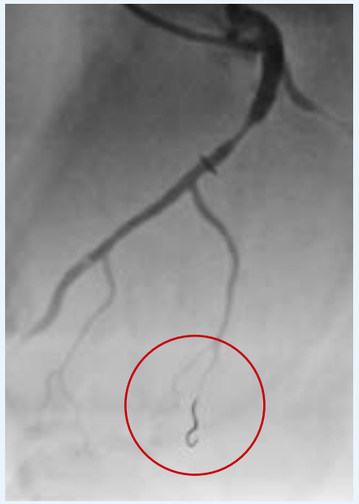


Recommended Bail-out procedures

Coiling for coronary perforation

Coronary perforation

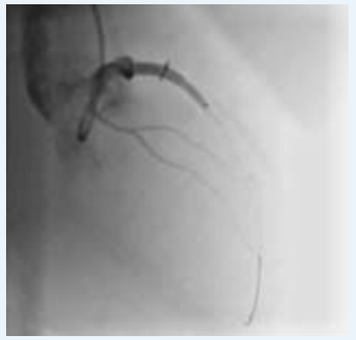
Coiling procedure



Successful coiling

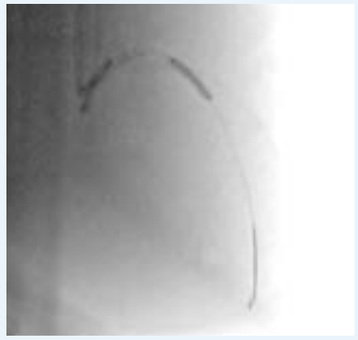
Ping-pong technique for coronary rupture

Coronary rupture



Balloon occlusion

Double guide catheter



Ping-pong technique

Covered stent

Successful stenting

STRUCTURE

HEARTROID Structure series cover catheterization procedures for four valves: Aortic, Pulmonary, Mitral, Tricuspid as well as plug-closures for LAA, ASD and PFO under X-ray and echocardiographic imaging. ASD/PFO model is also capable of Transeptal puncturing process.

Structure Model

TAVI Model

CEP Dry Model

MV Model

TV Model

TPVI Model

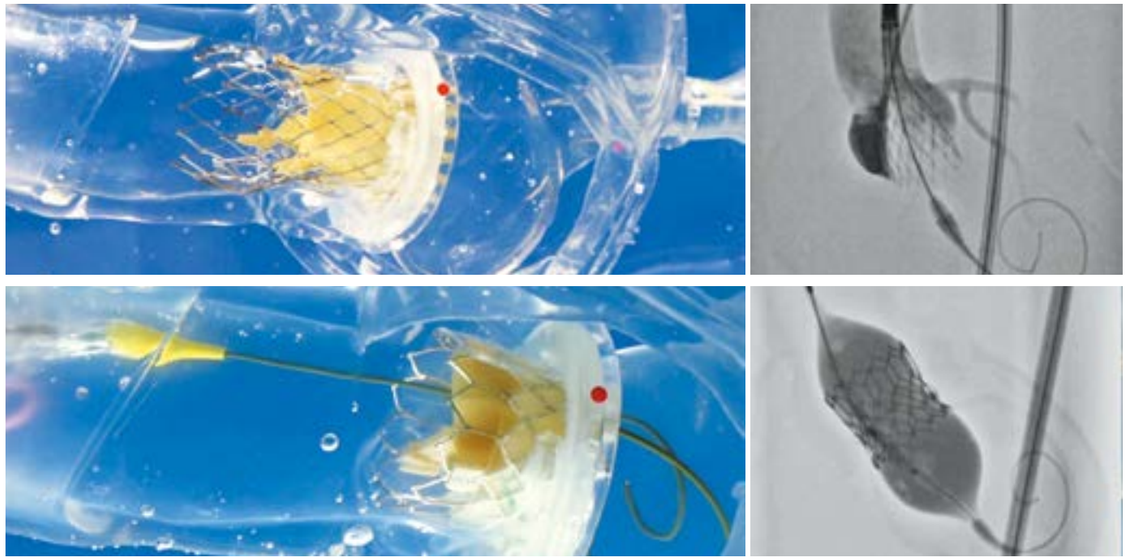
LAA Model

TSP Model

ASD/PFO Model

CSR Model

TAVI Model



HEARTROID TAVI model facilitates technical training for TAVI (Transcatheter Aortic Valve Implantation), a novel therapy for aortic valve stenosis. With a pulsatile pump included in the set, stent valve deployment under blood flow can be verified by simultaneous aortography. This system is appropriate for both balloon-expandable and self-expandable transcatheter stent valves. It is also applicable to both the TF and TA approach. It can be used under various circumstances, from hands-on seminars at an exhibition booth to simulation under X-ray fluoroscopy in the cath lab. The detachable aortic valve part enables quick preparation and effective training.

Valve Implantation

* Recommended angles when using TAVI model 37˚ .

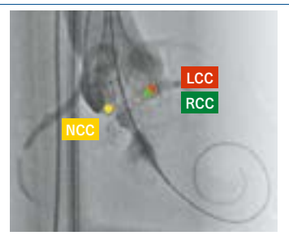
Cusp Overlap Technique with HEARTROID

LAO Technique

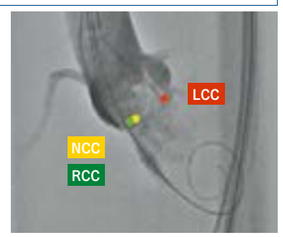
LAO View LAO17 CAU10

Cusp Overlap Techniquie

Native Coplanar View AP CAU10



Cusp Overlap View RAO25 CAU15



LAO View LAO17 CAU10

Components

Heart Model for TAVI

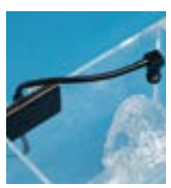
Heart model suitable for practical training in TAVI under X-ray fluoroscopy in the cath lab.

Valve parts

One of the valves shown below is included.

Smart Tank for TAVI

HEARTROID Pump Type-2



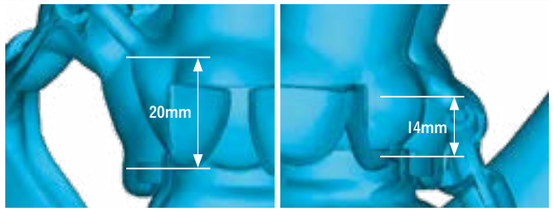
Camera Set

Carry Case

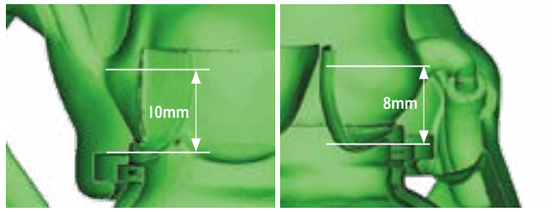
Web

Coronary Height Variety

Normal Position | RCA 20㎜ LCA 14㎜ (Type1)

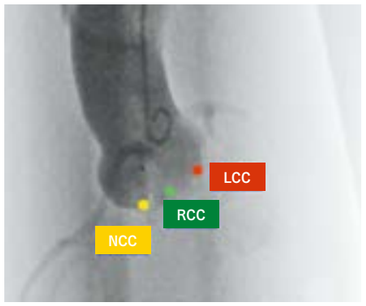


Lower Position | RCA 10㎜ LCA 8㎜ (Type2)



Valve Parts Type (Detachable and Switchable)

Aortic Stenosis Valve

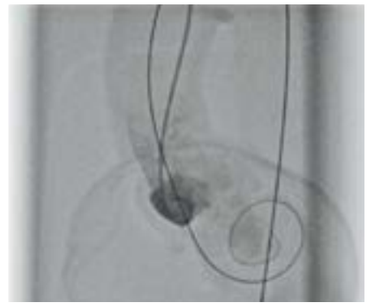


LAO View LAO17 CAU10

Bicuspid Aortic Valve

LAO View LAO17 CAU10

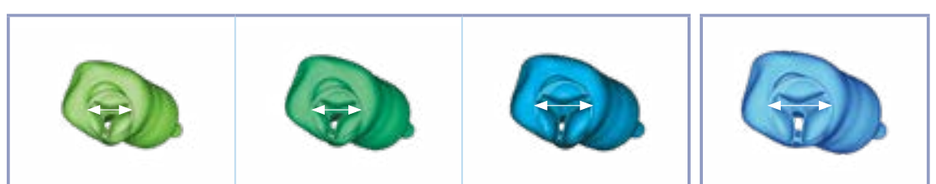
Aortic Regurgitation Valve



LAO View LAO17 CAU10

Valve Parts Size (Aortic annulus)

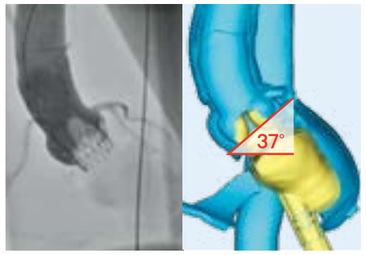
∗ Φ19 mm module is compatible only with the type 2 design of the heart body module



Aortic Annulus	19 mm	22 mm	25 mm	28 mm
Heart body	Type M			Type L

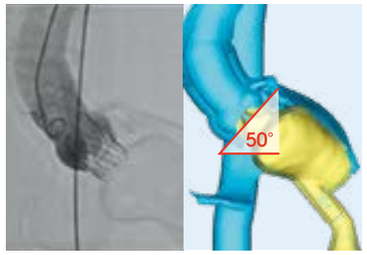
Aortic Angle variety

TAVI Model 37°



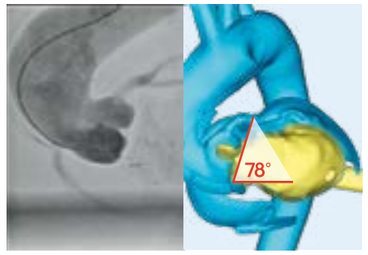
* Recommended angles
Coplanar view : AP CAU10
Cusp Overlap View : RAO25 CAU15

TAVI Model 50°



* Recommended angles
Coplanar view : AP CAU10
Cusp Overlap View : RAO13 CAU26

TAVI Model 78° (Horizontal Aorta Model)



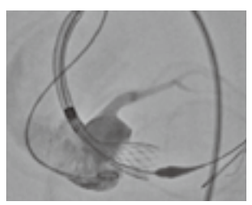
* Recommended angles
Coplanar view : LAO9 CAU19
Cusp Overlap View : RAO7 CAU44

TAVI Model Compatibility

Aortic Angle	37°	50°		78°
Heart model	Type M	Type M	Type L	Type HZ
Tank	37° tank	50° tank		HZ tank
Pump	Type-2			
Valve parts	19 / 22 / 25 mm	19 / 22 / 25 mm	28 mm	25 mm
	AS / Bicuspid / AR	AS / Bicuspid / AR		AS / Bicuspid
videoscope	○	○		–
Alternative Access	–	○		–
CEP	–	○		–

TAVI Horizontal Model

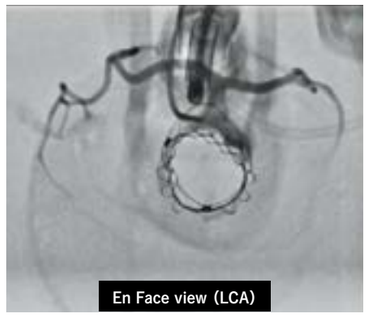
Web

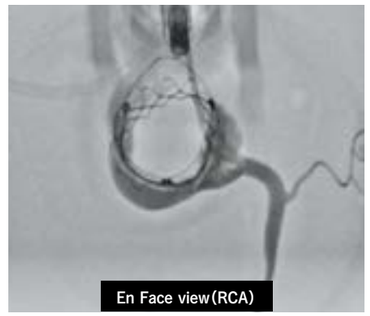


Horizontal aortic root anatomy causes difficuty in the valve positioning and delivery system retrieval process in TAVI procedure. This model has increased aortic angulation of 78° as measured between plane of aortic valve annulus and horizontal plane.

TAVI Videoscope Model (For Coronary access)

Web



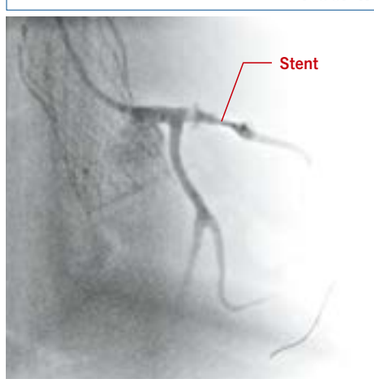


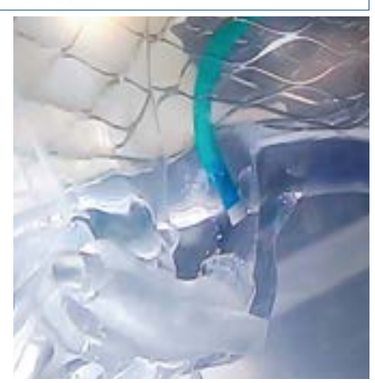
TAVI Videoscope Model can facilitate coronary access simulation training with a videoscope showing En Face view. This system can help interventional cardioplogists understand the catheter manipulation when coronary access is needed for post-TAVI patients. With X-ray furuoroscopy, one can compare the routine AP or LAO view and En Face view as shown above.

Coronary access & Post-TAVI PCI

Coronary access

Post-TAVI PCI





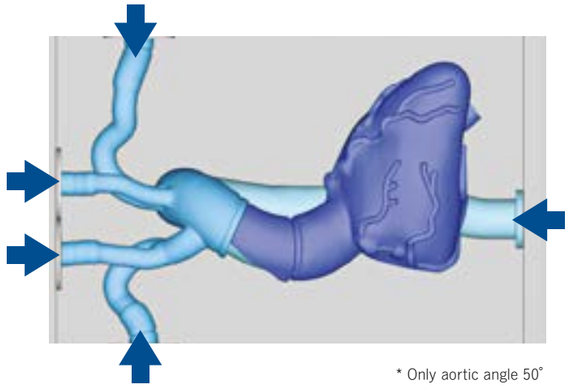
Judkins catheter with guide-extention cathter

TAVI Alternative Access Model

TAVI Alternative Access Model can facilitate simulation training for prosthetic valve implantation from both carotid and subclavian artery. This system can help interventional cardiologists understand the procedure of alternative approaches when standard femoral access is not recommended. Cerebral embolic protection (CEP) procedure simulation can be also realized with this model with or without X-ray.

From subclavian artery

From right carotid artery



* Only aortic angle 50˚

Components

Heart model, valve parts and pump are common to conventional TAVI model.

Special tank for TAVI Alternative Access

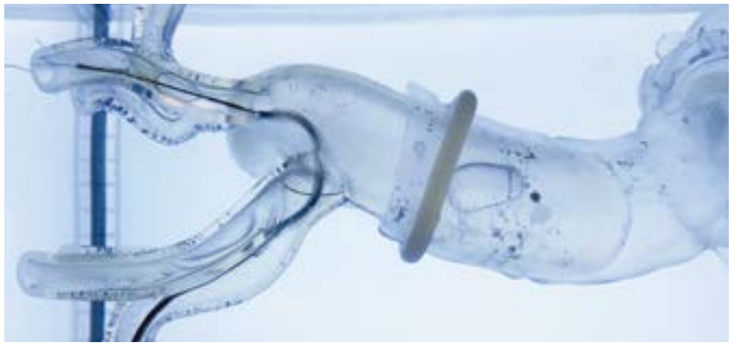
HEARTROID Pump Type-2

Camera Set

Carry Case

TAVI CEP Model (For Cerebral Embolic protection)

Web



This model can facilitate the following series of simulation including 1. Cerebral embolic protection, 2. TAVI Valve implantation, 3. Post-TAVI coronary access & PCI (including pre-TAVI coronary protection) under X-ray fluoroscoy and camera view.
Aortic angle variety: 37˚ /50˚ . With Videoscope / without videoscope

Components

Heart model, valve parts and pump are common to conventional TAVI model.

Special tank for TAVI CEP

HEARTROID Pump Type-2

Camera Set

Carry Case

TAVI CEP Dry Model

CEP Dry Model is a handy simulation kit focusing on understanding the usage of the cerebral embolic protection procedure during transcatheter valve implantation.

Components

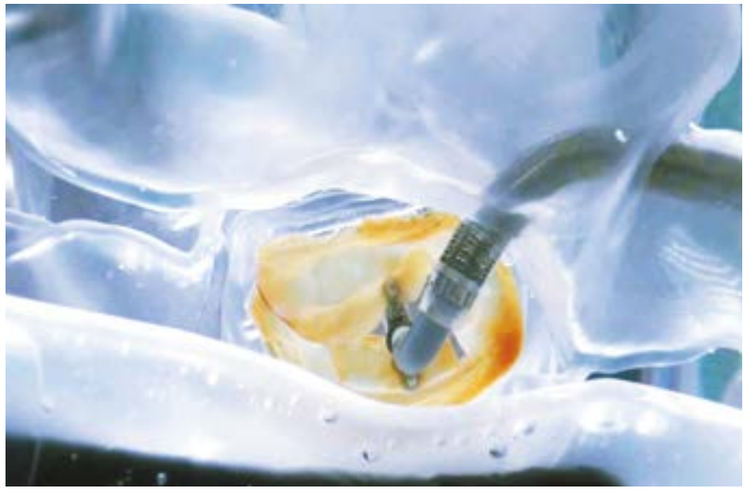
Vessel part for TAVI CEP Dry Model

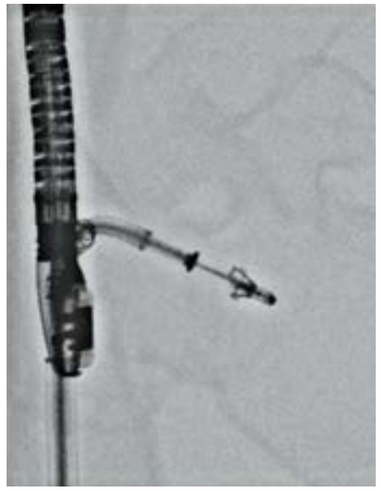
LED Panel

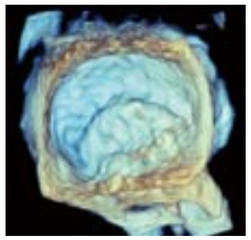
Carry Case

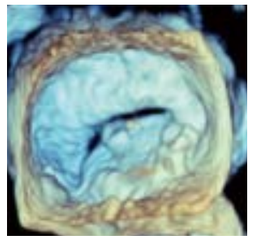
MV Model

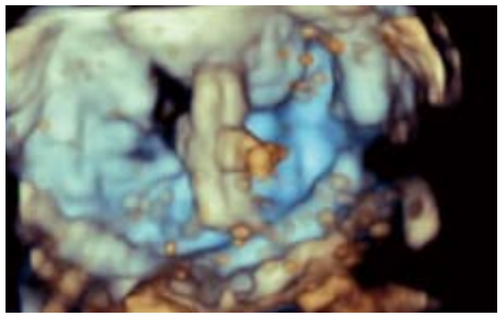
Web











3D echographic image

This model allows simulation training of percutaneous mitral valve clipping (TEER: transcatheter edge-to-edge repair) under fluoroscopy and transesophageal echocardiography guidance. The mitral valve has a removal design, and it opens and closes with the pulsatile flow produced by the pump.

TEE image

Components

Heart Model for MV Model

Smart Tank for MV

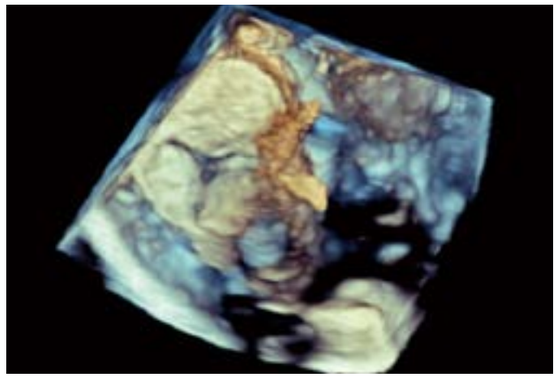
HEARTROID Pump Type-3

Camera Set

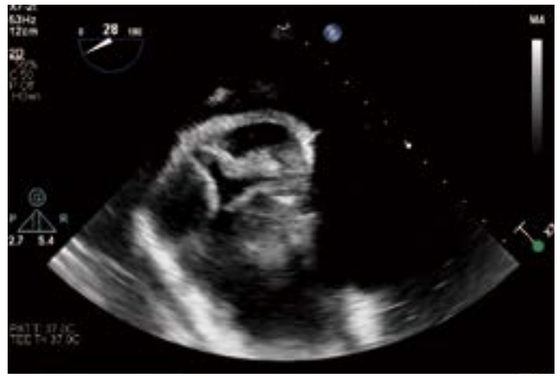
Carry Case(M)

TV Model

This model allows simulation training of percutaneous tricuspid valve clipping procedure (TEER : transcatheter edge-to-edge repair) under fluoroscopy and transesophageal echocardiography guidance. The tricuspid valve can open and close triggered by the pulsatile flow generated by the pump.



3D echographic image



2D image

Components

Heart Model for TV Model

Smart Tank for TV

HEARTROID Pump Type-3

Camera Set

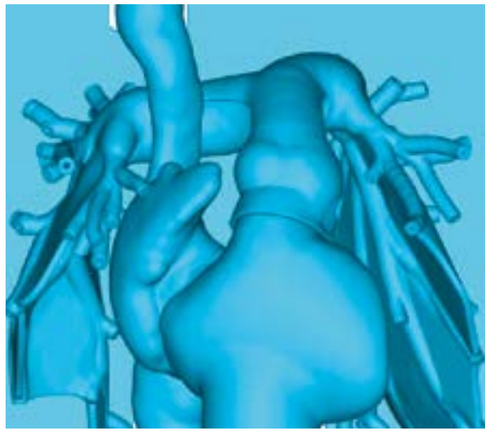
Carry Case (L)

TPVI Model

Web

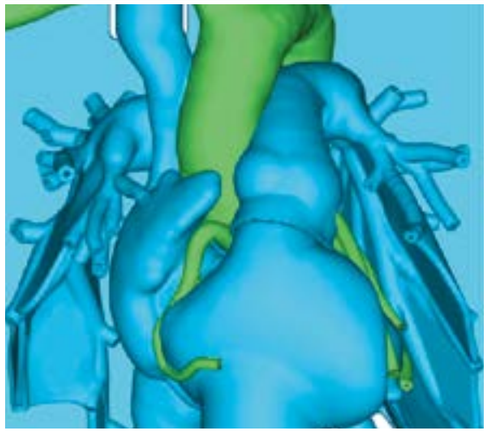
This model can facilitate TPVI (Transcatheter Pulmonary Valve Implantation) simulation training. Based on hybrid design concept, soft heart model with main pulmonary artery connected with hard peripheral pulmonary arteries can realize a real tactile feeling during the procedure as well as smooth valve removal process after implantation. There are two types of models which can be used under X-ray fluoroscopy; Type S for self-expandable valve implantation and Type B suitable for balloon-expandable valve, which is equipped with aorta and coronary arteries.

Type S



TypeS for self-expandable valve

Type B



TypeB for balloon-expandable valve

Components

Heart Model for TPVI

Smart Tank for TPVI

HEARTROID Pump

TPVI Type S
needs type2 pump only

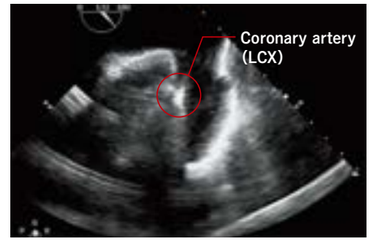
TPVI Type B
needs both typeI and type2

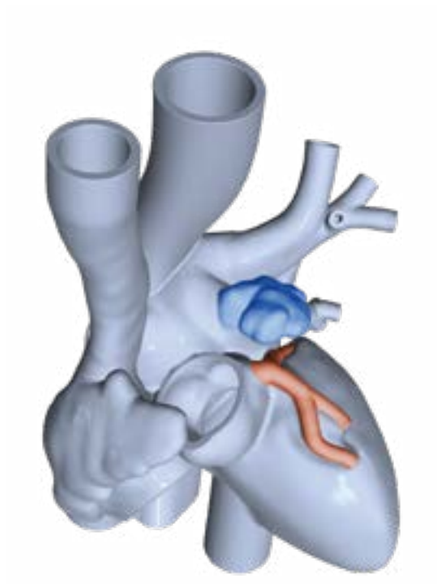
Camera Set

Carry Case (L)

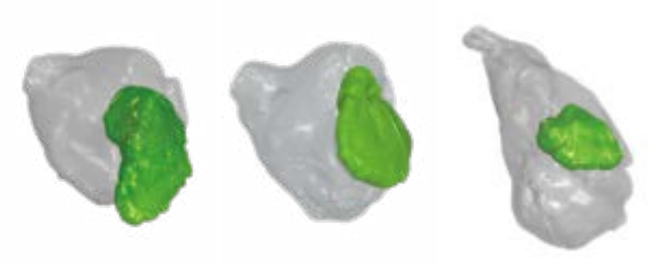
LAA Closure Model

Web





HEARTROID LAA closure model facilitates training for the LAA (left atrial appendage) closure procedure, a catheter-based operation for patients at risk of stroke due to atrial fibrillation. Guided by echocardiography, the delivery catheter can be inserted through the atrial septum and the occluder can be deployed in the LAA. Blood flow from the left atrium to the left ventricle is simulated, so the location of the occluder can be confirmed by X-ray fluoroscopy during the procedure.



Wind Sock model **Chicken Wing model** **Broccoli model**

* Wind Sock model LAA size variety Orifice diameter: 23mm and 32mm

Components

Silicon or Hydrogel Heart Model

Smart Tank for LAA Closure

HEARTROID Pump Type-3

Camera Set

Carry Case(M)

TSP Model

Web

TSP (Atrial septal puncture)

HEARTROID TSP model is designed for training in atrial septal puncture (TSP) procedure guided by imaging modalities such as X-ray fluoroscopy, transoesophageal ultrasound (TEE) and intracardiac echocardiography (ICE).
Camera images can help trainees plan where to puncture and actually confirm the punctured position following the procedure, allowing simulation training for the ideal puncture position according to the purpose, such as catheter ablation or SHD procedures. You can also learn how to navigate with ICE, how to move a steerable catheter and how to perform radiofrequency-based puncturing techniques.

TEE view

ICE view

Components

TSP and ASD/PFO closure are sharing the same heart model and pump so that both procedures can be realized by just changing the atrial septum parts.

Silicon or Hydrogel Heart Model for TSP/ASD/PFO Closure

HEARTROID Pump Type-3

Smart Tank for TSP/ASD/PFO Closure

Atrial septum parts (detachable and switchable)

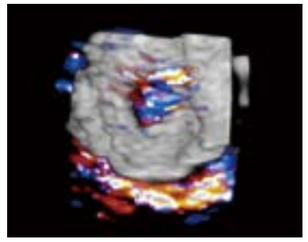
Camera Set

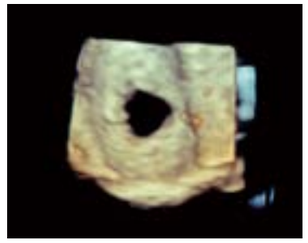
Carry Case(M)

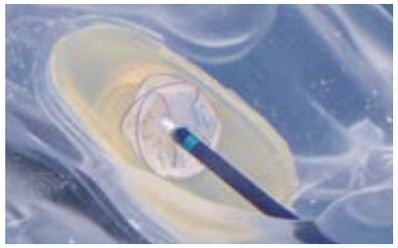
ASD/PFO closure Model

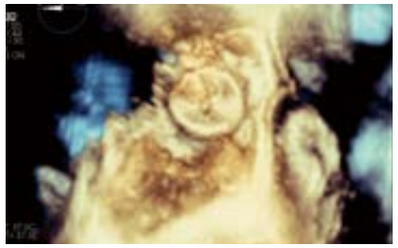
Web

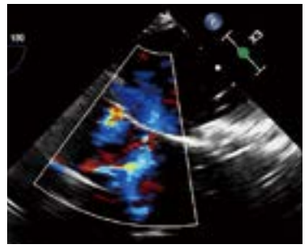
ASD (atrial septal defect) closure





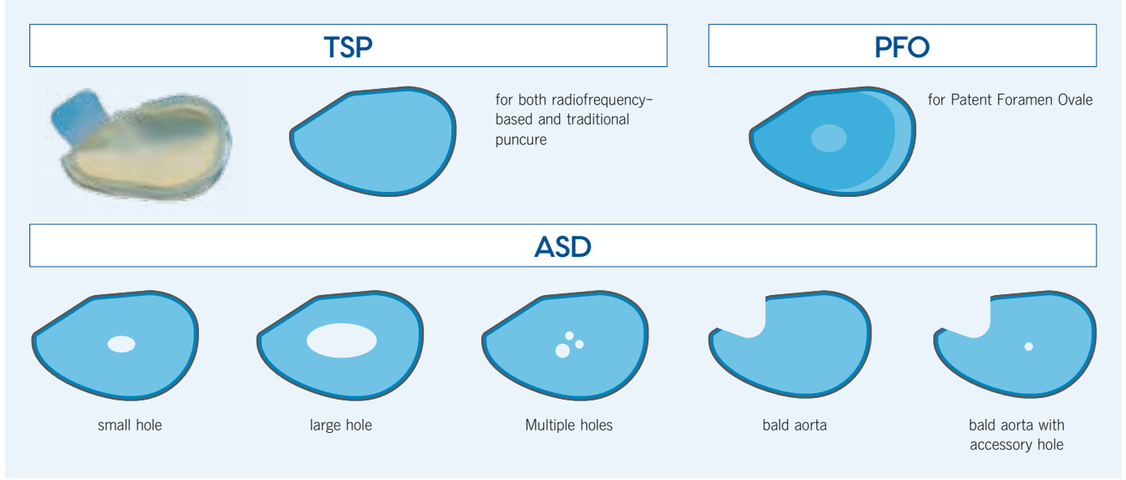






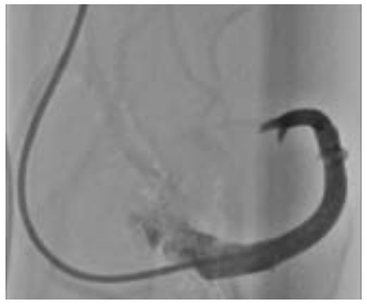
HEARTROID ASD closure model facilitates training for the ASD (atrial septal defect) and PFO (Patent Foramen Ovale) closure procedure, a catheter-based operation for patients with congenital defects or foramen of the atrial septum. Guided by echocardiography, a delivery catheter can be inserted through the septal defect into the left atrium, and the closure device can be deployed across the ASD/PFO. As blood flow from the left atrium to the left ventricle is simulated, the location of the occluder can be confirmed by X-ray fluoroscopy during the procedure.

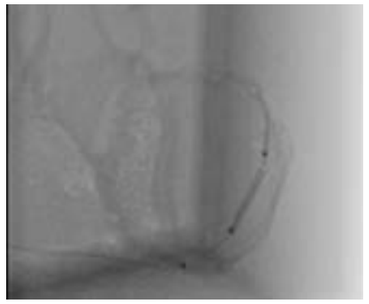
Atrial septum parts (Detachable and Switchable)

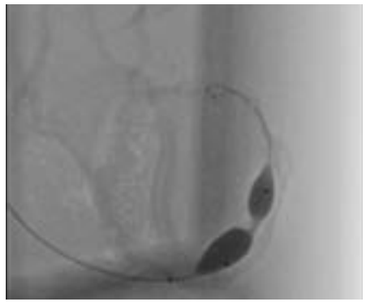


CSR Model

Web







HEARTROID CSR model is designed for training in Coronary Sinus Reducer deployment under X-ray fluoroscopy and camera view. This model can facilitate how to plan where to deploy the device and learn the entire procedure from coronary venography to safe removal of the delivery catheter through the simulation training. Coronary sinus part is removable and can be moved on to the next procedure immediately.

Components

Heart Model for CSR

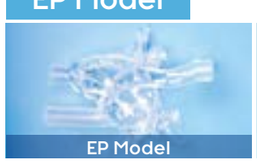
Smart Tank for CSR

HEARTROID Pump Type-I

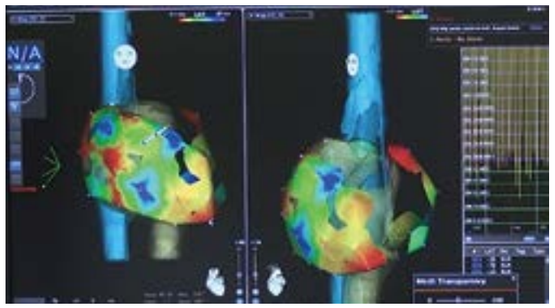
Camera Set

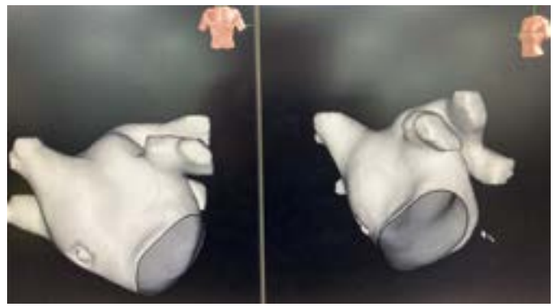
Carry Case

EP Model



EP Model

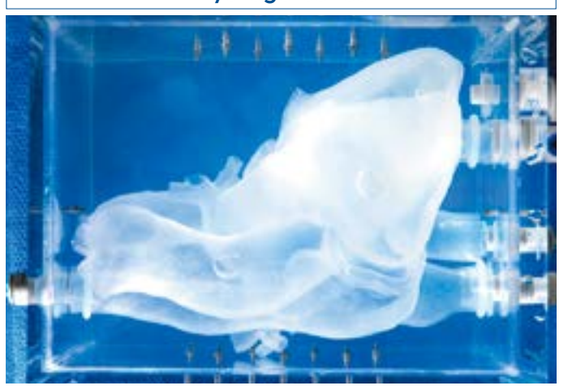




HEARTROID EP model facilitates technical training for catheter manipulation and 3D mapping, which are basic skills required for catheter ablation. With this model, the Brockenbrough Method (atrial septal puncture) guided by ICE (intracardiac echocardiography) can also be simulated. The model is appropriate for both the internal jugular and femoral vein approach.

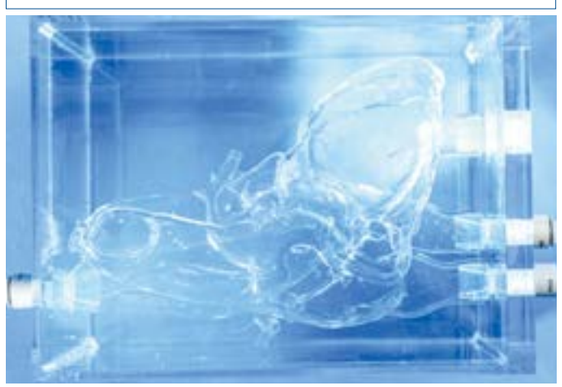
Material

Hydrogel series



For Electromagnetic field and ICE imaging

Silicon series

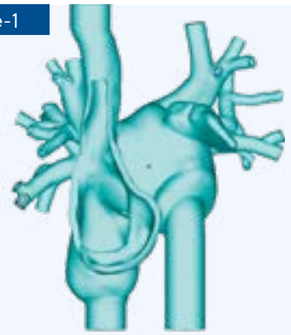


For camera view

Geometry

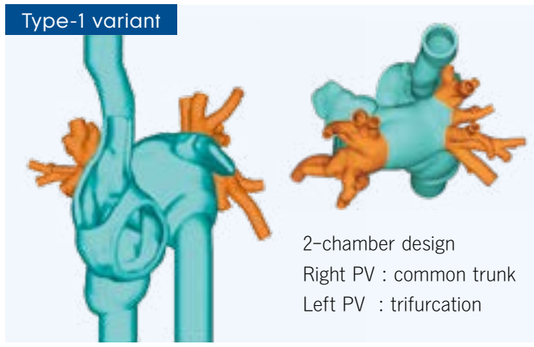
Model size can be magnified or reduce depending your request.

Type-1



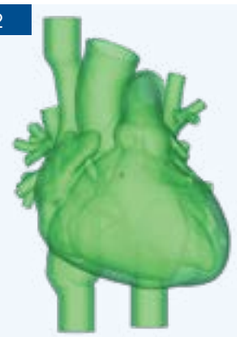
2-chamber design
RA and LA with
SVC, IVC

Type-1 variant



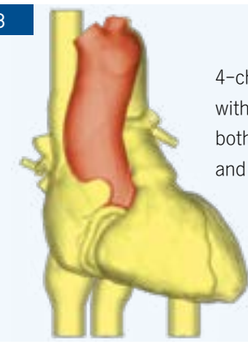
2-chamber design
Right PV : common trunk
Left PV : trifurcation

Type-2



4-chamber design
RA, LA, RV, LV with
SVC, IVC and CS

Type-3



4-chamber design
with SVC, IVC and CS for
both retrograde (arterial)
and venous approach

Compatible procedures

	TypeI		Type2		Type3	
	2-ch		4-ch		venous and arterial approach	
	Silicon	Hydrogel	Silicon	Hydrogel	Silicon	Hydrogel
3D mapping (geometry creation)		✓		✓		✓
ICE imaging				✓		✓
PVI with cryoballoon	✓					
Lead implantation for coronary sinus and branches			✓		✓	

Components

Heart model for EP
Silicon or Hydrogel

Smart Tank for EP

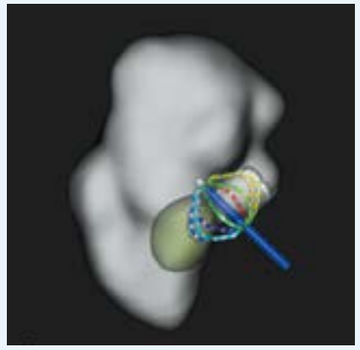
HEARTROID Pump Type-I

Camera Set

Carry Case (L)

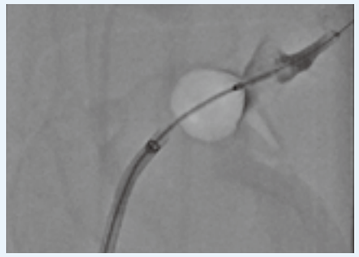
Recommended procedures

3D mapping (Geometry Creation)



Hydrogel heart model with conductive property can facilitate the simulation of geometry creation process, which is the fundamental procedure for electrophysiologists. Type1 and 2 are designed to be accessed from IVC through atrial septum, and retrograde approach from the femoral artery is acceptable with Type3.

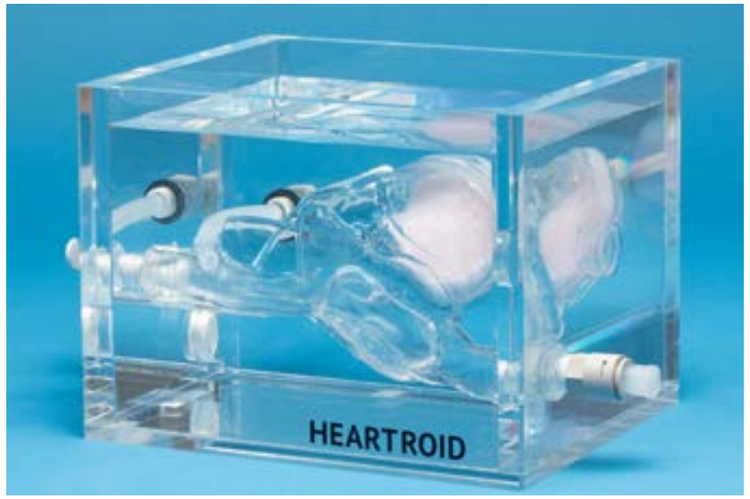
PVI (PFA and Cryoballoon ablation)




HEARTROID PVI model facilitates simulated training of a pulmonary vein isolation procedure, with or without X-ray visualization. During cryoballoon catheter ablation, the operator is able to check whether pulmonary vein flow is blocked appropriately using a pulsatile pump which is included in the standard set. This model features all four pulmonary veins (RSPV, RIPV, LSPV, LIPV), and ICE (intracardiac echocardiography) is usable when passing through the atrial septum.

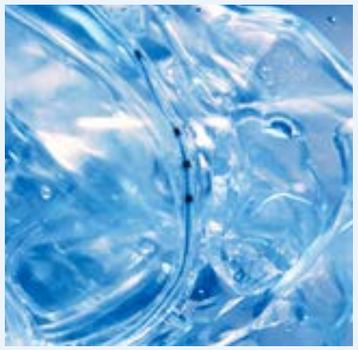
CRT Model

Web




HEARTROID CRT (Cardiac Resynchronization Therapy) model is designed for training under X-ray fluoroscopy and camera view. This model can facilitate the simulation training of how to insert the intravenous leads from subclavian/axillary vein to the coronary sinus (CS), right ventricular apex and atrial septum.
Coronary venography can be realized with the pulsatile pump.Each part of coronary sinus, right ventricular apex and atrial septum is removable and can be moved on to the next procedure immediately.

Lead implantation for coronary sinus and branches

Silicon-based transparent heart model with CS (coronary sinus) facilitates the lead implantation procedure under X-ray fluoroscopy and camera view. Coronary sinus and marginal veins can be visualized with contrast injection.

Components


Heart Model for CRT


Smart Tank for CRT

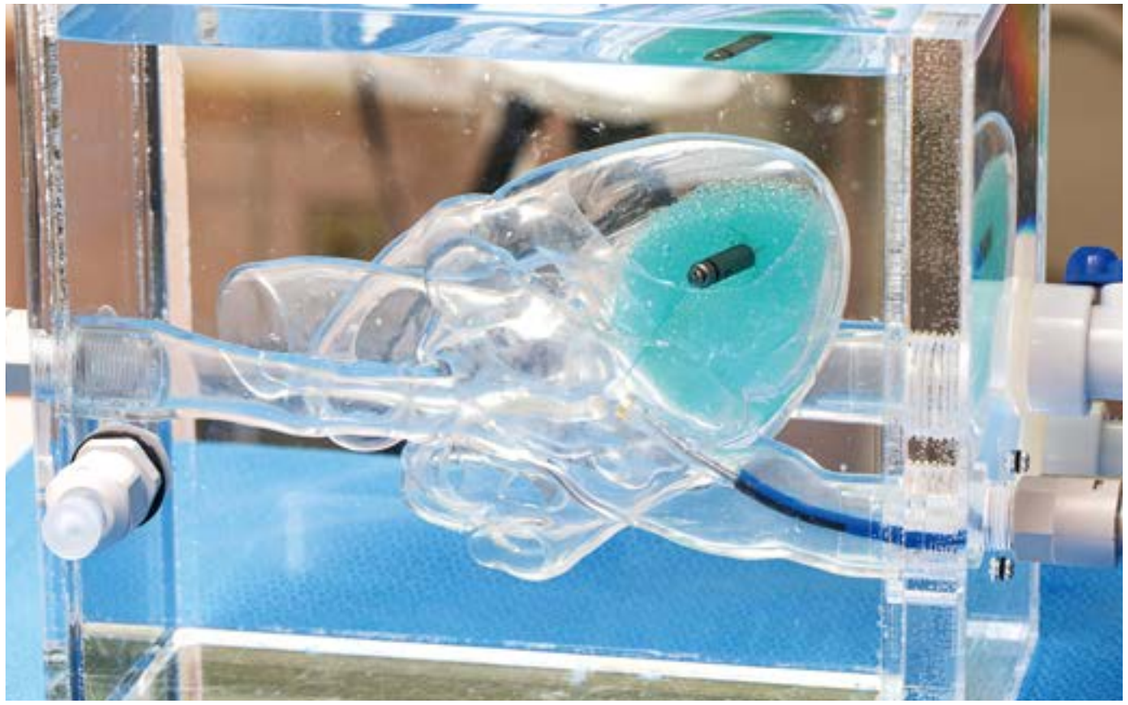

HEARTROID Pump Type-I


Camera Set


Carry Case

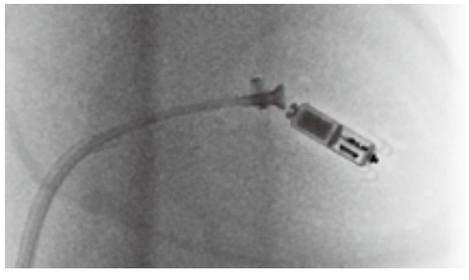
Leadless PM Model

Web



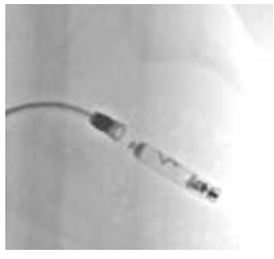
HEARTROID Leadless PM model facilitates simulation training of a leadless pacemaker device implantation procedure, with or without X-ray visualization. The operator is able to simulate full procedure; inserting a delivery catheter from femoral vein via right atrium into right ventricle, confirming the position of the device on the right ventricular septum with contrast under X-ray and deployemnt followed by checking fixation process.

Leadless PM implantation with HEARTROID

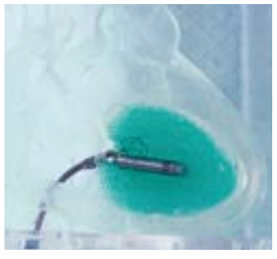


Leadless PM model facilitates both device implantation and retrieval procedure with or without X-ray fluoroscopy. By combining X-ray and camera view, the simulation training will be more efficient by visualizing the behavior of the device in the heart, which is not visible in the real case.

Implantaion procedure



Retrieval procedure



Components

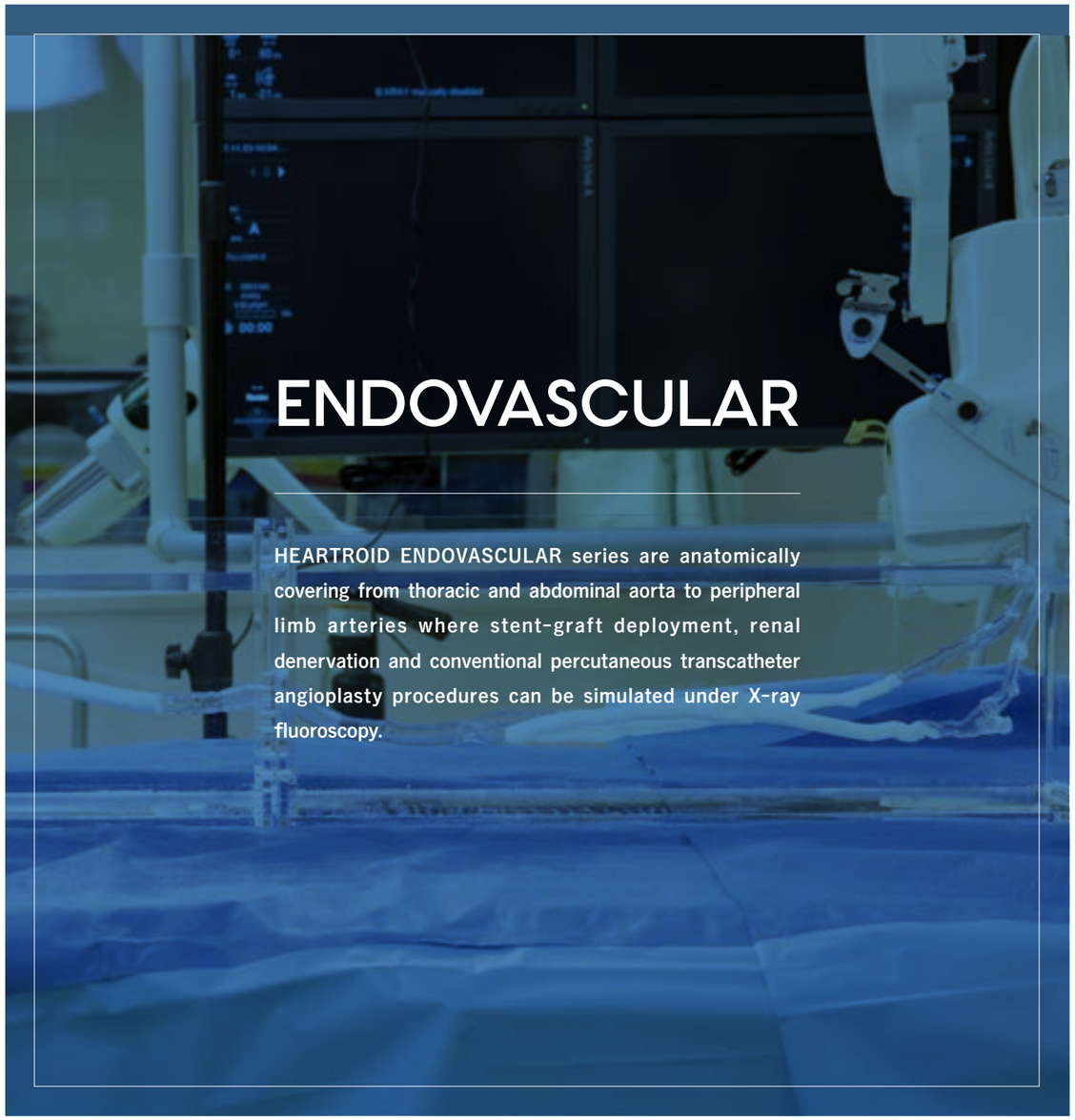
Heart Model for Leadless PM

Smart Tank for Leadless PM

HEARTROID Pump Type-3

Camera Set

Carry Case



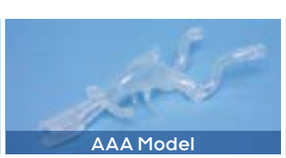
ENDOVASCULAR

HEARTROID ENDOVASCULAR series are anatomically covering from thoracic and abdominal aorta to peripheral limb arteries where stent-graft deployment, renal denervation and conventional percutaneous transcatheter angioplasty procedures can be simulated under X-ray fluoroscopy.

Peripheral Model


EVT Model

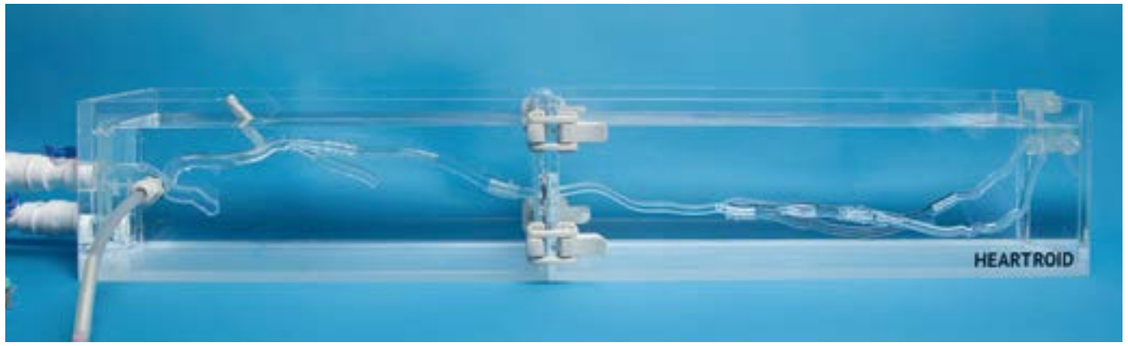

TAA Model


AAA Model


RDN Model

EVT Model

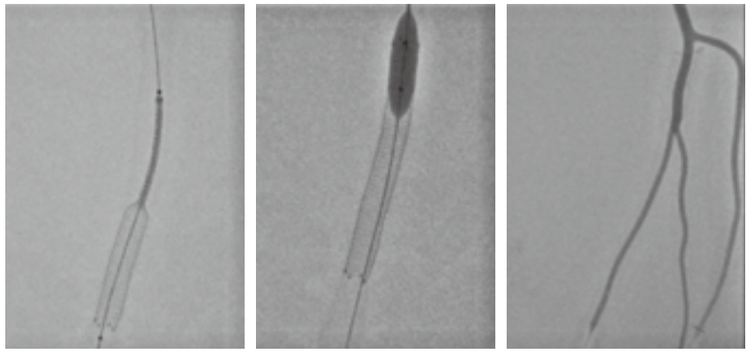
Web




Bail-out for perforation


Stent graft


Laser ablation



HEARTROID EVT model facilitates simulation for peripheral intervention procedures under X-ray fluoroscopy and non-fluoroscopic situation. This vessel model covers from the terminal aorta to the plantar arch, and supports both retrograde and antegrade approaches. Smart tank for EVT model can be divided between the above-knee area (AK) and the below-knee area (BK) for easy setup.

Lesion parts (Detachable & Disporsable)

Similar to the HEARTROID coronary artery model, this system can incorporate detachable lesion parts including stenosis, chronic total occlusion (CTO) and severe calcification, thus allowing procedures of various cases such as stent deployment and debulking procedures.

Components


Vessel Model

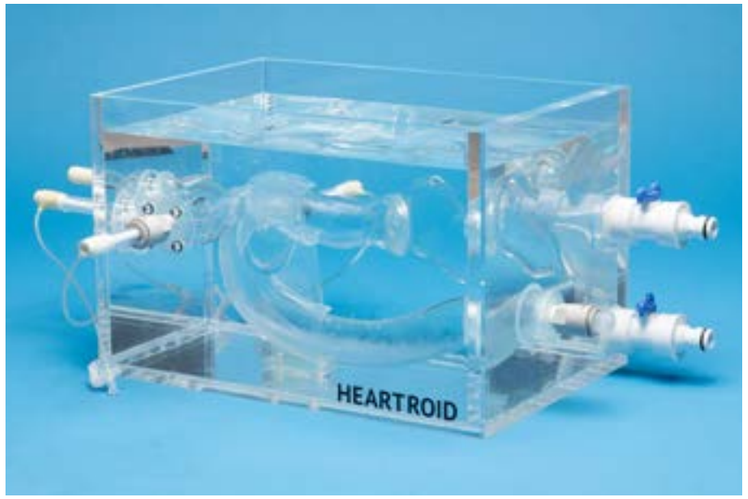

Smart Tank for EVT


HEARTROID Pump Type-I

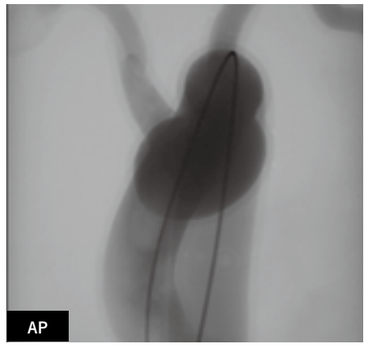

Camera Set

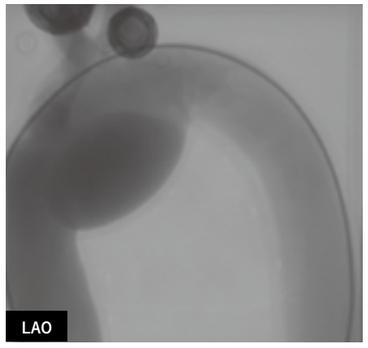

Carry Case

TAA Model



HEARTROID TAA model is designed for training in thoracic stent graft deployment under X-ray fluoroscopy and camera view. This model can facilitate how to plan where to deploy the device and learn the entire procedure from aortography to safe removal of the delivery catheter through the simulation training. We have two models based on the position of aneurysm; one is positioned at distal aortic arch and the other one is positioned at the branches of cerebral vessels.





Components

Model for TAA

Smart Tank for TAA

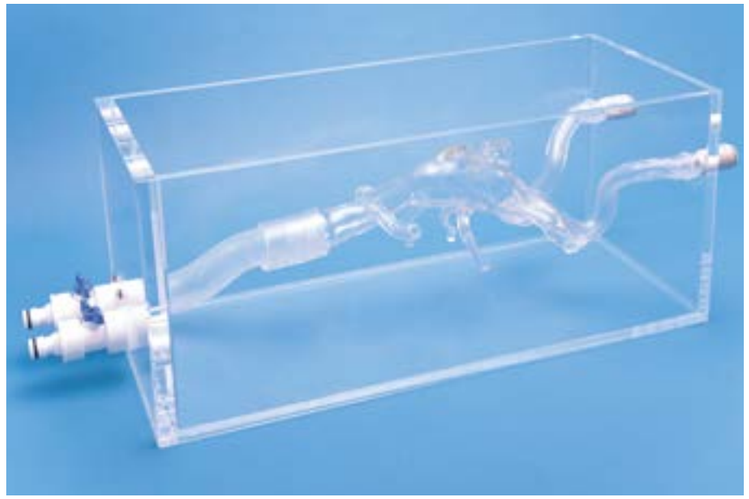
HEARTROID Pump Type-2

Camera Set

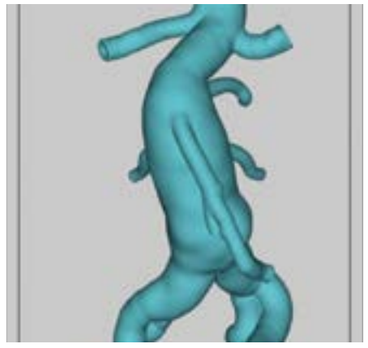
Carry Case (L)

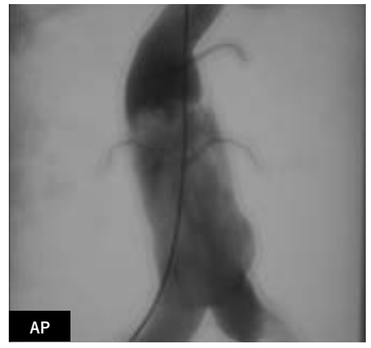
AAA Model

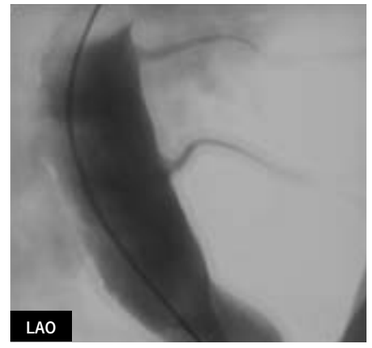
Web



HEARTROID AAA model is designed for training in abdominal stent graft deployment under X-ray fluoroscopy and camera view. This model can facilitate how to plan where to deploy the device and learn the entire procedure from aortography to safe removal of the delivery catheter through the simulation training. Aortic aneurysm is positioned at infra-renal aorta. Branches include bilateral renal arteries, testicular arteries and inferior mesenteric artery.







Components

Model for AAA

Smart Tank for AAA

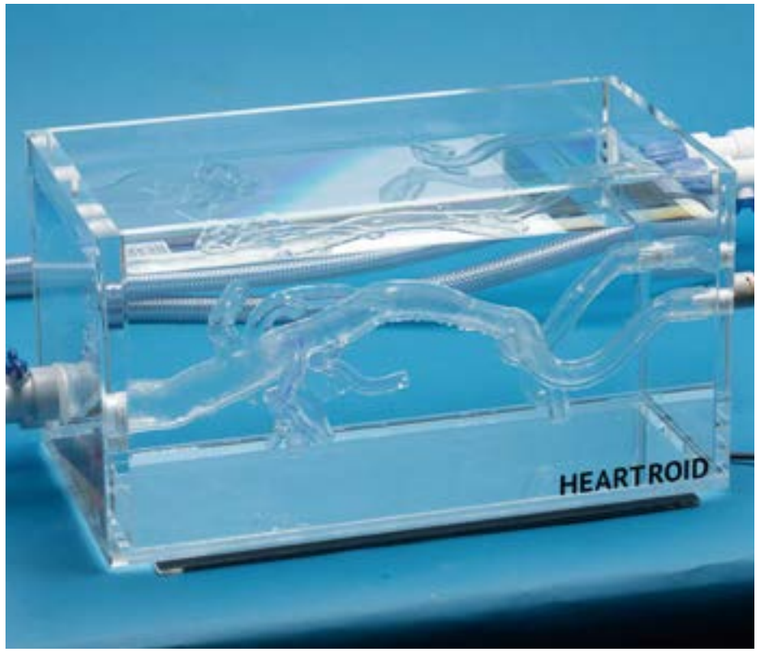
HEARTROID Pump Type-I

Camera Set

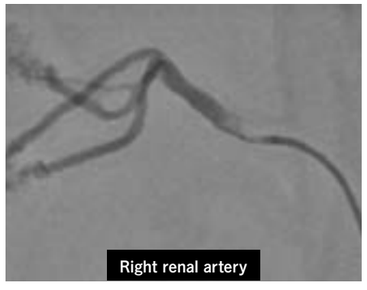
Carry Case (L)

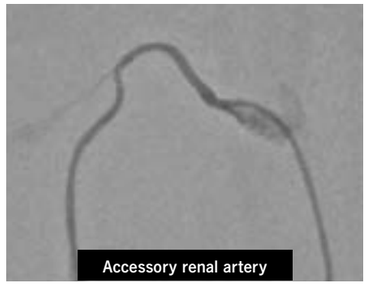
RDN Model

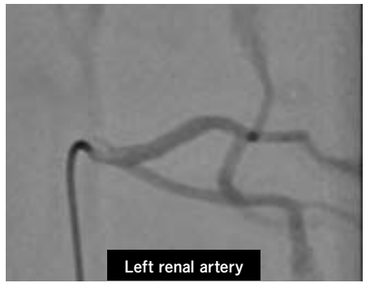
Web



HEARTROID RDN model allows trainees to understand how to manipulate catheters during RDN (renal denervation) procedure with or without X-ray fluoroscopy.
With a pulsatile pump included in the set, blood flow from the aorta to the extremity can be simulated and verified by realistic angiographic imaging. Right renal artery designed to fit Judkins right has an accessory artery and left renal artery is designed to fit IMA-shaped guiding catheter.


Right renal artery


Accessory renal artery


Left renal artery

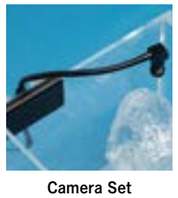
Components

Product specifications can be customized and are subject to change without notice.
Please contact JMC for details.

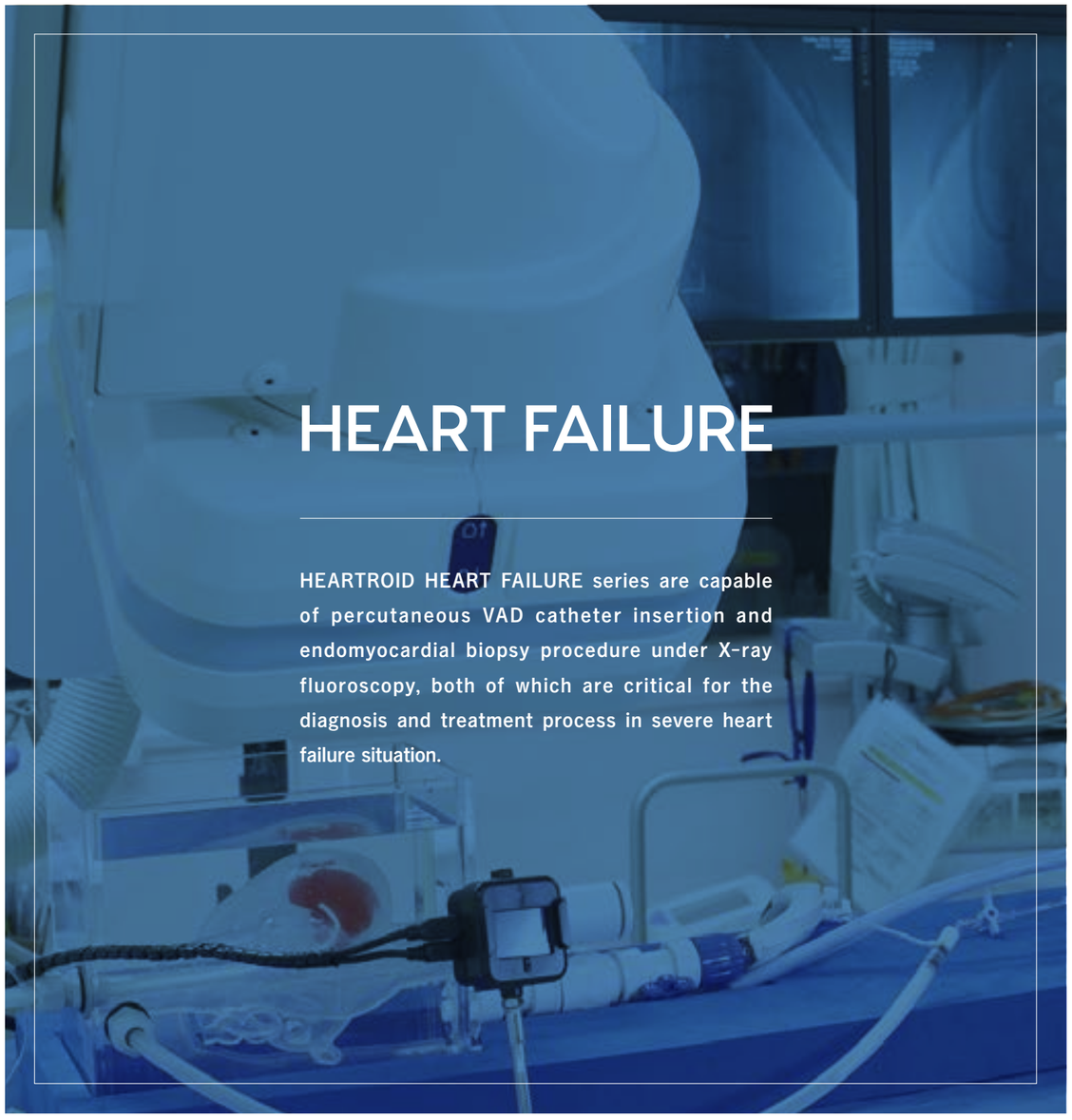

Model for RDN


Smart Tank for RDN


HEARTROID Pump Type-I


Camera Set


Carry Case (L)

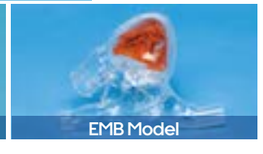


HEART FAILURE

HEARTROID HEART FAILURE series are capable of percutaneous VAD catheter insertion and endomyocardial biopsy procedure under X-ray fluoroscopy, both of which are critical for the diagnosis and treatment process in severe heart failure situation.

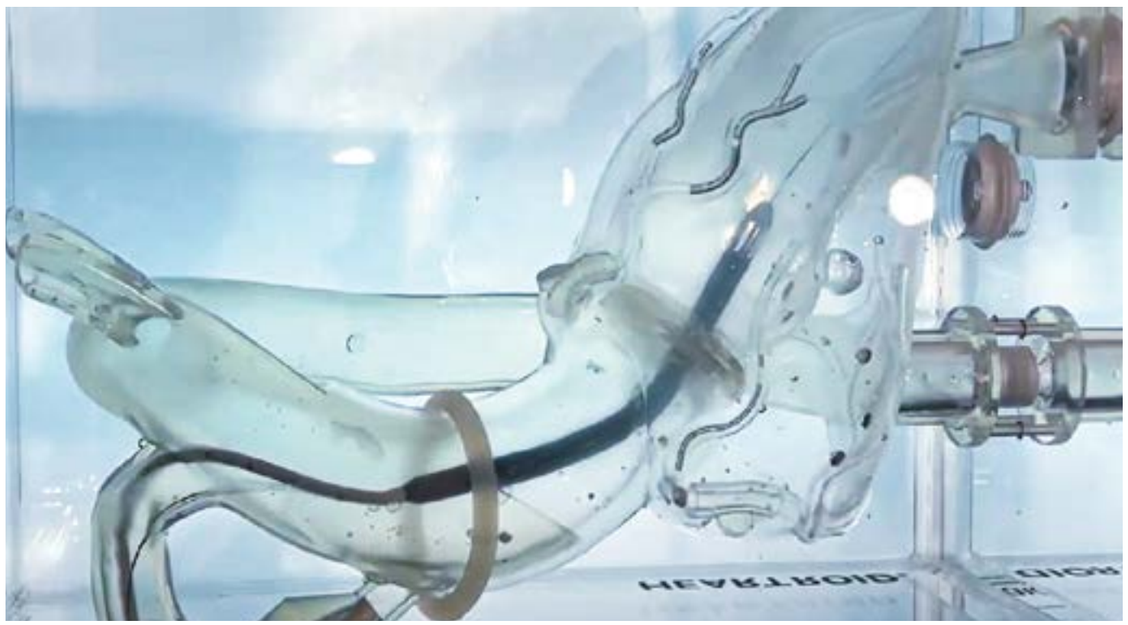
Heart Failure Model

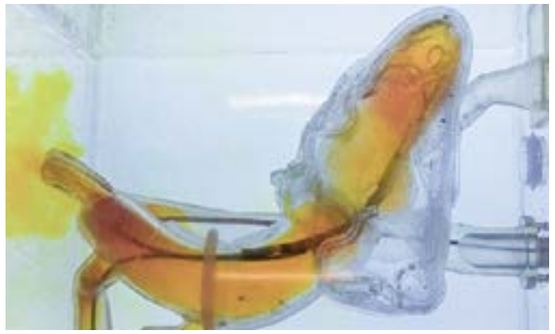

Percutaneous VAD Model

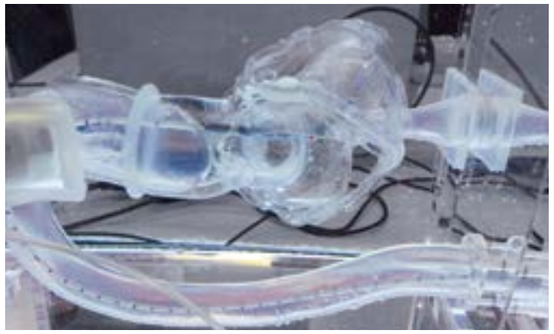

EMB Model

Percutaneous VAD Model

Web







HEARTROID Percutaneous VAD (ventricular assist device) model is designed for training under X-ray fluoroscopy and camera view. This model can facilitate how to insert the device from femoral or subclavian artery to the appropriate position.
Left ventricle contracts with the pulsatile pump, so it can visualize the comparative situation with or without the support of percutaneous VAD. It can also facilitate the visualization of the coronary flow with X-ray angiography or the camera along with the dye injection.

Components

Model for Percutaneous VAD

Smart Tank for VAD

HEARTROID Pump Type-2

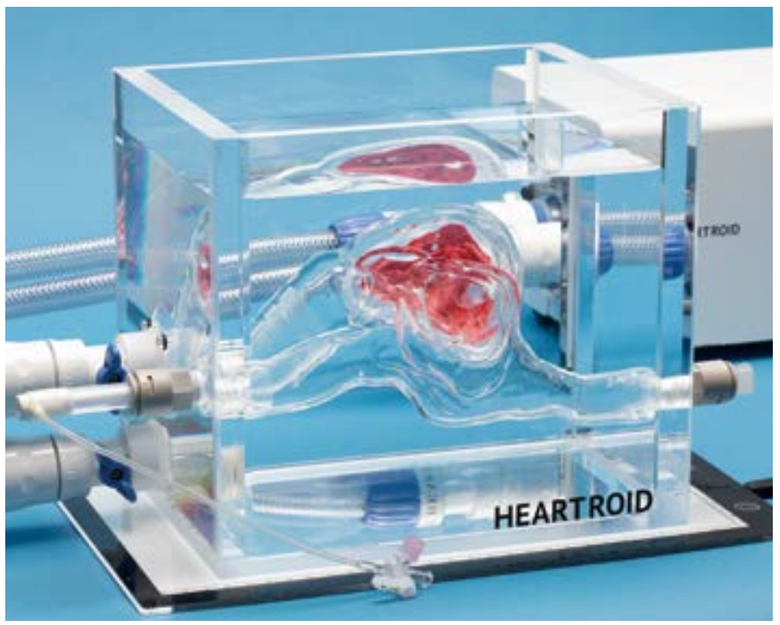
Artificial Vessel Graft

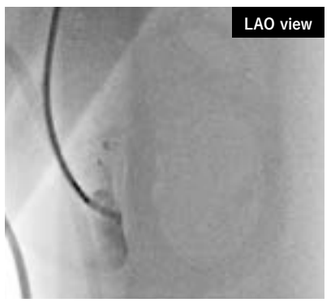
Camera Set

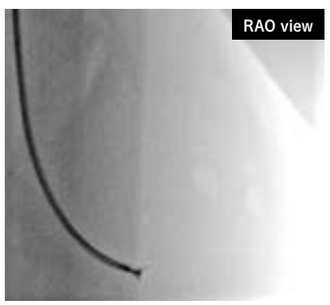
Carry Case (L)

EMB Model

Web



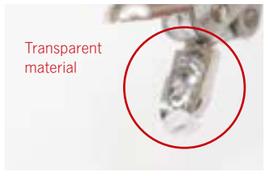




With this model, the myocardial biopsy procedure can be simulated under X-ray fluoroscopy, similar to the set-up in a real cath lab. The transparent heart model enables one to practice the procedure by confirming the direction of the sheath and forceps through both an X-ray image and a camera image.

As the material used to simulate the ventricular septum is different from that of the ventricular free wall, it is easy to confirm whether the tissue was removed from the appropriate area after the procedure. Using the X-ray image, it is possible to determine if the forceps are facing towards the free wall. The compact camera with a flexible arm can provide a clear image from various angles.

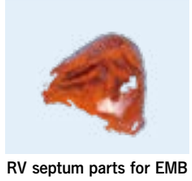
Tissue removed from the ventricular septum.



Tissue removed from the ventricular free wall, not the ventricular septum.

Components

Model for EMB



RV septum parts for EMB

Smart Tank for EMB

HEARTROID Pump Type-I

Camera Set

Carry Case

NV

HEARTROID NV is the first neurovascular model as HEARTROID brand, which has a lot of experience in cardiac catheterization simulators.

This model realistically reproduces the tactile feeling of catheter operation as well as the way it looks under X-ray fluoroscopy by making the most of our technology accumulated to date.

The HEARTROID NV is ideal for physicians seeking to improve their skills through simulation training and for sharing the procedures with brand-new devices.

Components

Model for NV

Smart Tank for NV

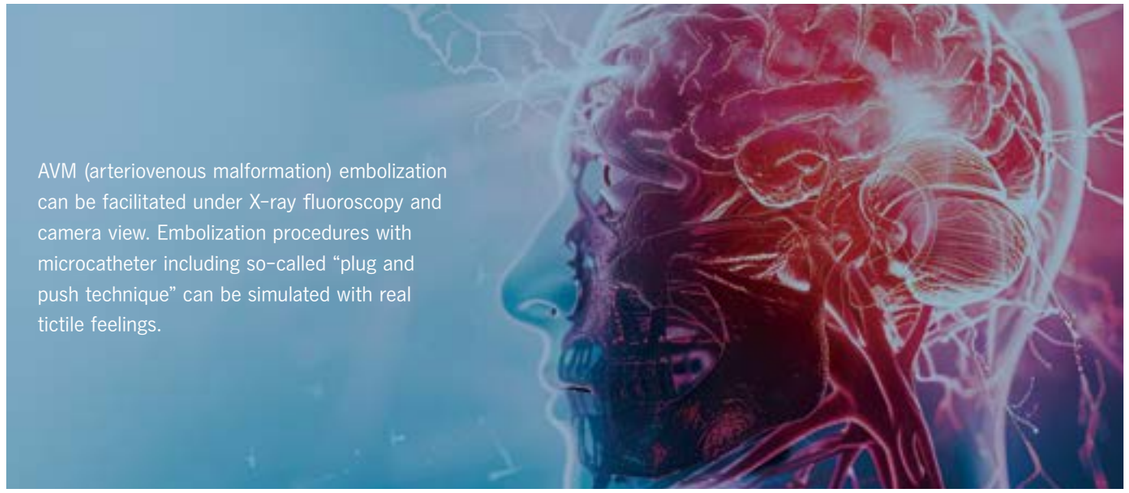
HEARTROID Pump Type-I

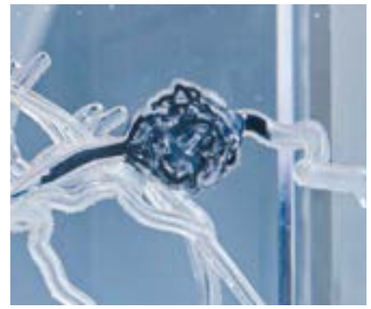
Camera Set

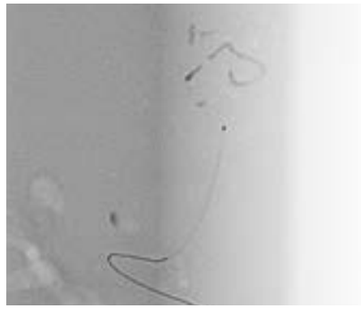
Carry Case

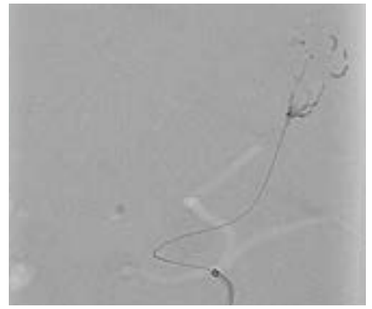
AVM embolization

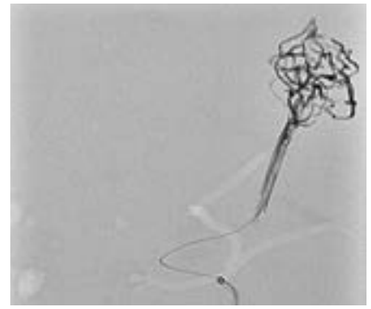
AVM (arteriovenous malformation) embolization can be facilitated under X-ray fluoroscopy and camera view. Embolization procedures with microcatheter including so-called “plug and push technique” can be simulated with real tictile feelings.

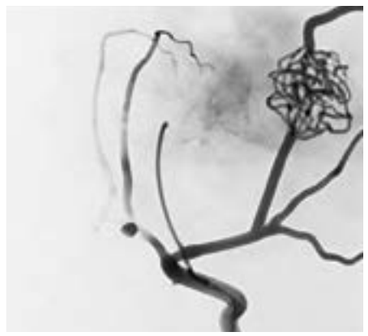




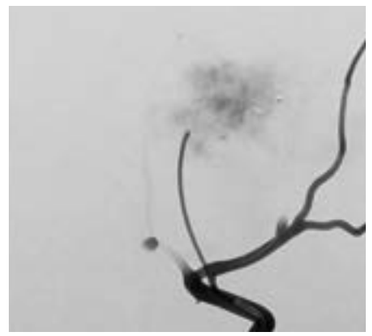








Before

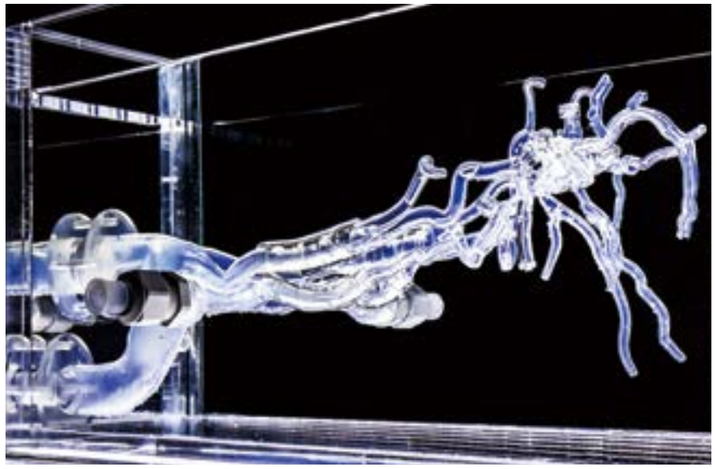


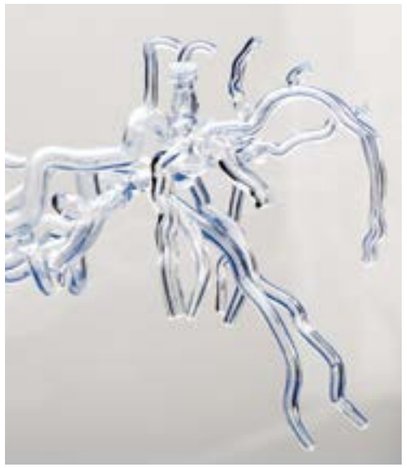
After

3D Imaging

NV Model

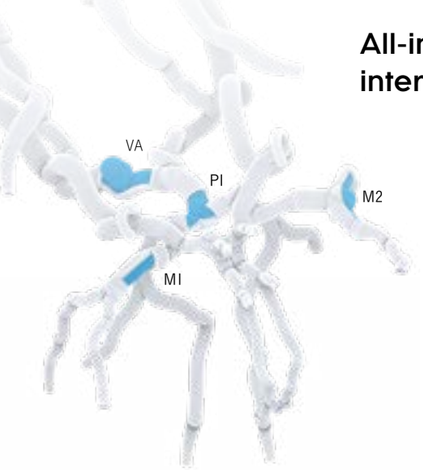
Web

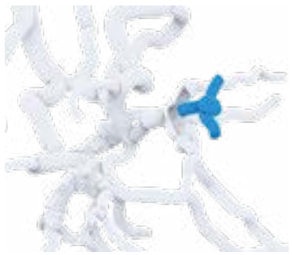




By reproducing blood flow with a dedicated pulsating pump, cerebral angiography can be performed as in actual clinical practice. This trans-parent vascular model created by using a 3D-printing technology allows us to directly observe the behavior of the devices such as embolic coils for cerebral
aneurysms and stent retrievers for thrombus retrieval in stroke cases. The system enables effective simulation training by monitoring both direct visual images and X-ray fluoroscopic images, which cannot be realized in actual clinical practices.

All-in-one catheterization simulator for neurovascular interventional procedures





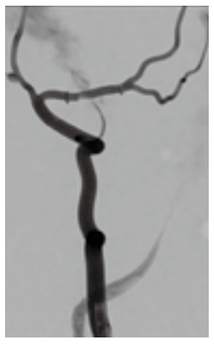
Lesion parts can realize various scenarios

NV model platform has a pocket for attaching “lesion parts”.
Various scenarios for simulation training can be implemented by replacing the “lesion parts” depending on your purpose.

Cerebral angiography can be performed with contrast under X-ray fluoroscopy

Before thrombus retrieval

Successful microcatheter delivery



After thrombus retrieval

Recommended procedures

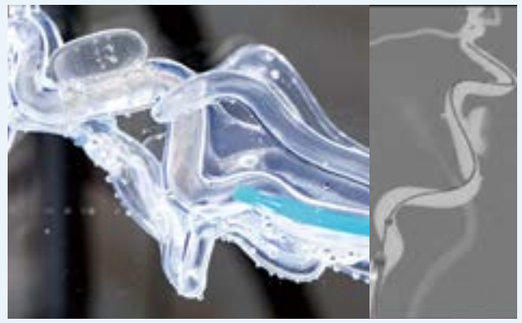
Coil embolization

As in actual clinical practices, cerebral angiography in DSA mode can be performed, and using this image as a reference, the catheter can be delivered to the lesion and an embolic coil can be implanted in the aneurysm. This procedure can be repeated over and over again by replacing the aneurysmal lesion parts.

Thrombectomy

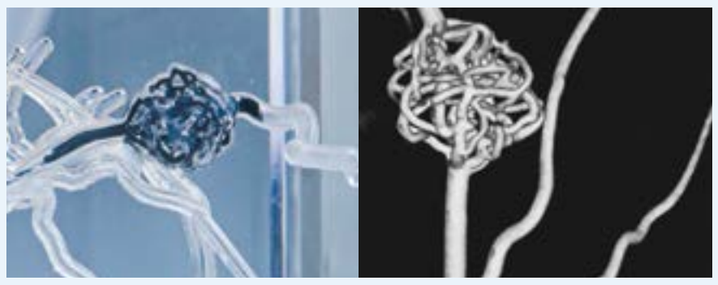
As in actual clinical practice, a series of procedures can be performed from delivery of the stent retriever to thrombus retrieval while performing cerebral angiography. The procedure can be repeated by replacing the disposable thrombus lesion parts.

Flow-diverter deployment



A removable aneurysm (ϕ15 mm) is available for simulation training on the Flow-diverter system, a new treatment method for large cerebral aneurysms. The morphology and the size of aneurysms are customizable.

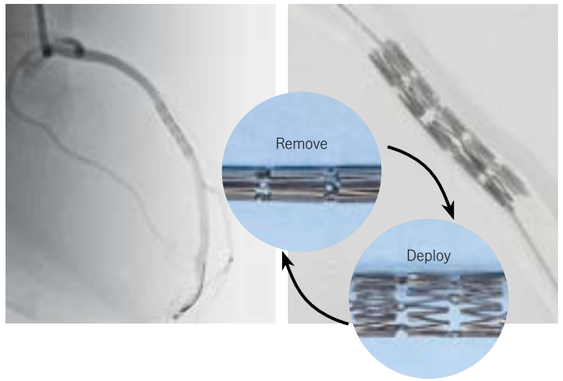
AVM embolization



AVM (arteriovenous malformation) embolization can be facilitated under X-ray fluoroscopy and camera view. Embolization procedures with microcatheter including so-called “plug and push technique” can be simulated with real tictile feelings.

Options and Accessories

Reusable Training Stent (Commercial stents can be used instead)



Used in Heart Coronary Model for PCI training.
Deployed with a balloon catheter as for a real PCI procedure (not for human use) and easy to remove.

Web

Camera Set

A compact camera with a flexible arm that can provide clear images from various angles.
Via the flexible arm, observation from various angles can be performed. Simple connection with a camera and monitor, a clear image can be attained.

Camera with arm : 15×15×30 (mm)
Special attachment : 280 (mm)
Outer size : 195×150×65 (mm)

Sheath Fixture

A portable sheath stabilizer easy to store in a small portable case.

ECG Pulse Generator

Pulse generator for synchronisation with CT and other modalities.

Heater System

Heater system to maintain the water temperature in the tank at a constant temperature close to the body temperature.

Pressure Monitoring System

System to display the pressure waveform at the catheter tip in the situation without a polygraph.

Special Carry Case

Standard Carry Case

Large carrying case customized for HEARTROID.
Total Outer Size: 730 x 515 x 325mm
Capacity: 96 liters
Capable of containing the components.

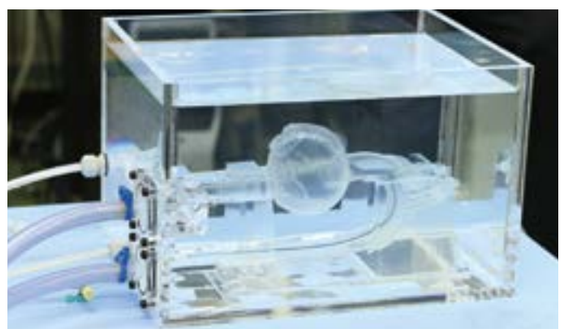
Damage Protection Case (M)

Total Outer Size: 712 x 500 x 337mm
Capable of containing the whole components.
BoxCaseTrunk
Capable of containing the components.

Damage Protection Case (L)

Total Outer Size: 854 x 540 x 380mm
Capable of containing the whole components.
BoxCaseTrunk. Capable of containing the components.
Detuchable casters (spare casters include).

HEARTROID for R & D



A high performance pump producing and controlling pulsatile flows and a water tank appropriate for various clinical scenarios and heart models are available. Please contact JMC for price and customization.

Specifications

HEARTROID Model	Coronary					Structure											EP				Peripheral				Heart Failure		NV
	PCI	CTO	BIF	CAG	CABG	TAVI	TAVI CEP Dry	MV	TV	TPVI	LAA (H) (Hydrogel)	LAA (Silicon)		TSP/ ASD/ PFO (H) (Hydrogel)	TSP/ ASD /PFO (Silicon)	CSR	EP (H) (Hydrogel)	EP (Silicon)	CRT	Leadless	EVT	TAA	AAA	RDN	Percu-taneous VAD	EMB	NV
Page	5	6	7 – 8	6	6	15 – 20	20	21	22	23	24	24		25 – 26	25 – 26	27	29 – 30	29 – 30	32	33 – 34	36	37	38	39	41	42	45 – 46

Components

Pulsatile Pump	Type-1	●					●						●	●	●	●	●	●		●	●	●			●
	Type-2		●				● ***															●			●		
	Type-3				●	●		●	●		●	●							●							●	
Smart Tank	—	●	●		●	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Hose	—	●	●														●				●				●	●
Sheath	—	●	●	●	●	●	●	●	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Lubricant	—	●	●		●	●	●		●			●	●		●	●	●	●	●	●	●	●	●	●	●	●
Special Parts	—	●	●		●	●					●	●	●			●	●		●	●	●				●	●
Camera	—	●							●								●					●			●	●
Sheath fixture	—	●							●								●					●			●	●
Carry case *	Standard	●							●								●					●			●	●
	Damage Protection M	●	●		●			●	●				●	●					●	●						●	●
	Damage Protection L		● **			●	●				●			●	●						●	●	●	●	●		

(H)··· Hydrogel series compatible　　*···Standard or Damage Protection carryig case can be selected　　**···TAVI HZ model　　***··· TPVI typeS needs type2 pump only
TPVI typeB needs both typeI and type2 pump

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-Joint research and development

FYC FUYO CORPORATION

This product was developed through the national project “R&D for medical devices”,
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GOOD DESIGN

HEARTROID wins “The Good Design Awards 2020”
presented by The Chicago Athenaeum

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