

GLÜCK 글뤽

MEDICAL
GLÜCK + GLÜCK



Congenital Heart Disease

Surgical training model

About us

Silicone heart model using 3D printed mold for CHD surgery training

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Gluck Co.,Ltd started 3D printing service in 2013 and has built a 3D printing mass production system using industrial SLA equipment. Since 2017, Gluck has entered the health care market based on 3D printing and advanced silicone molding techniques. In 2021, Gluck Medical Co.,Ltd was founded to develop and produce various medical silicone models.

We developed a high-end CHD model together with Dr. Shi-Joon Yoo of Sickkids hospital in Canada and are currently providing it to Sickkids hospital.

Another CHD model is developed in Korea with Prof. Whal Lee of Seoul National University hospital.



Shi-Joon Yoo

Title: Cardiac Radiologist
Diagnostic Imaging

Designations: PhD, MD

Sickkids Hospital

PREMIUM CHD model



Whal Lee

Title: Cardiovascular
Radiologist

Designations: PhD, MD

Seoul National University
Hospital

GENERAL CHD model

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PROCESS

Silicone heart model using 3D printed mold for CHD surgery training



Segmentation

Design a silicone model based on the data obtained by CT segmentation.

Mold Modeling

Make a mold for silicone casting using a 3D modeling program.

Silicone Casting

Pour silicone into the 3D casting mold and cast.

Assembly

Assemble parts into a complete product.

Special Features

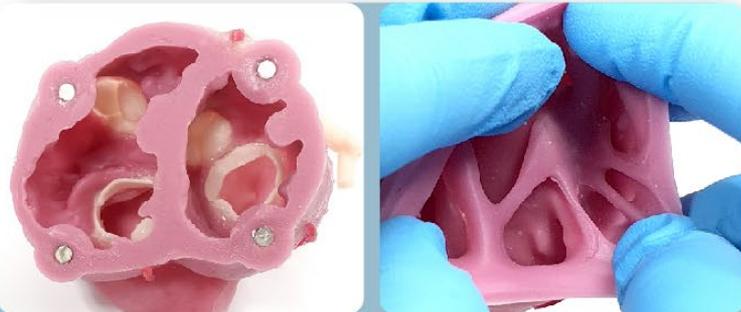
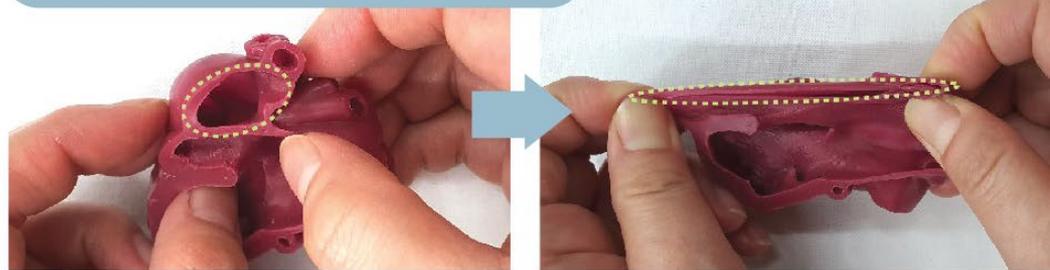
Silicone heart model using 3D printed mold for CHD surgery training

- Wide range of elasticity & strength
- elongation 500~900%
- Similar to tissue for cutting & stitching

Heart model printed with Agilus material



Our silicone heart model

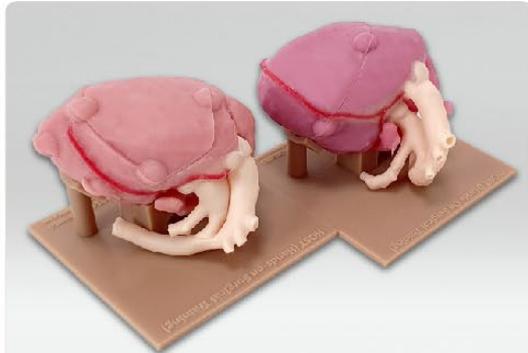


Premium models has a more realistic structure.

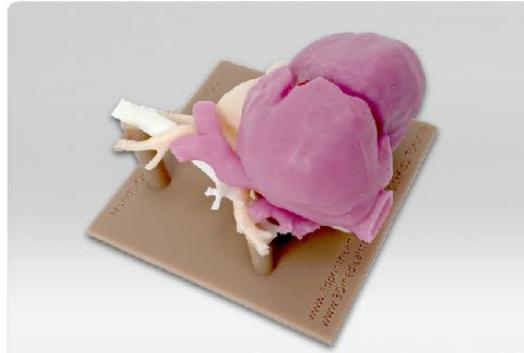
- This is a premium product that expresses the structure of the heart in detail.
- In addition to the current 10 types, about 40 types are planned to be developed.
- This models were adopted and used for online education in over 30 countries around the world hosted by Sickkids hospital in Canada.

PRIMIUM PRODUCTS

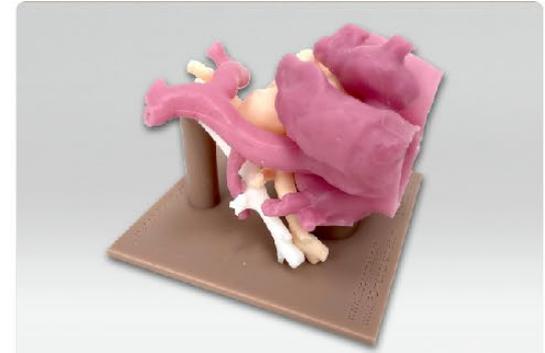
Silicone heart model using 3D printed mold for CHD surgery training



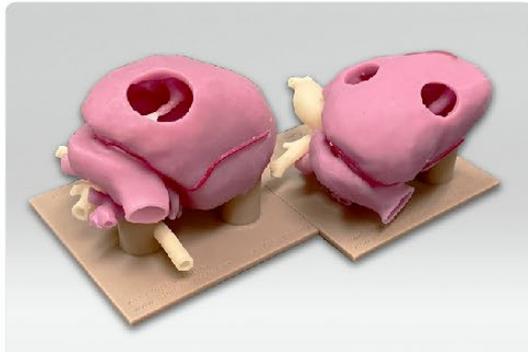
Transposition of great arteries
TGA 1LCx2R / TGA 1L2RCx



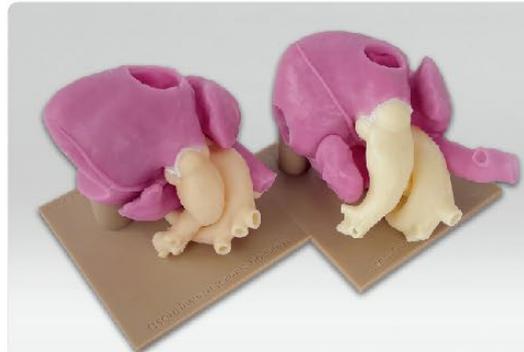
Hypoplastic left heart syndrome



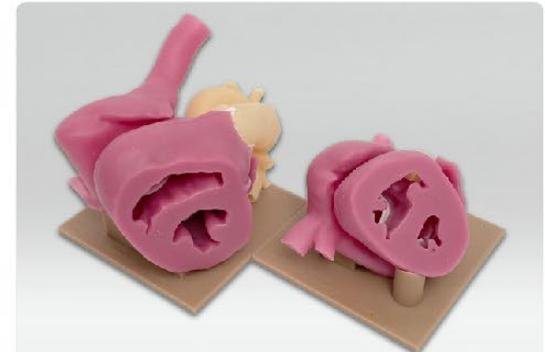
Blalock-Taussig shunt



Tetralogy of Fallot
with small PA / good PA



Ventricular septal defect
PM VSD / Doubly committed



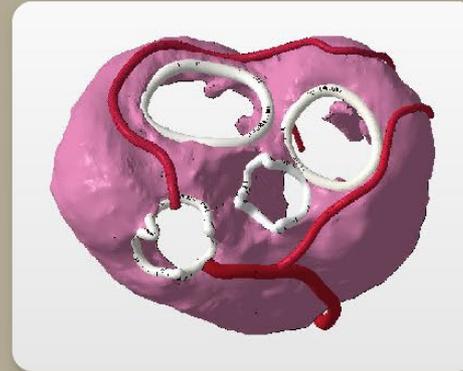
Supravalvular aortic stenosis
TGA 1LCx2R / TGA 1LCx2R

TGA 1LCx2R / 1L2RCx

Transposition of great arteries



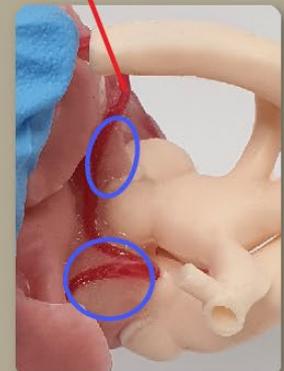
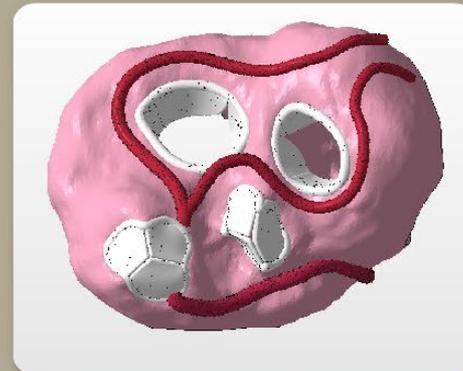
1LCx2R



* Epicardial fat surrounds the coronary artery

Coronary Arteries
Epicardial Fat

1L2RCx

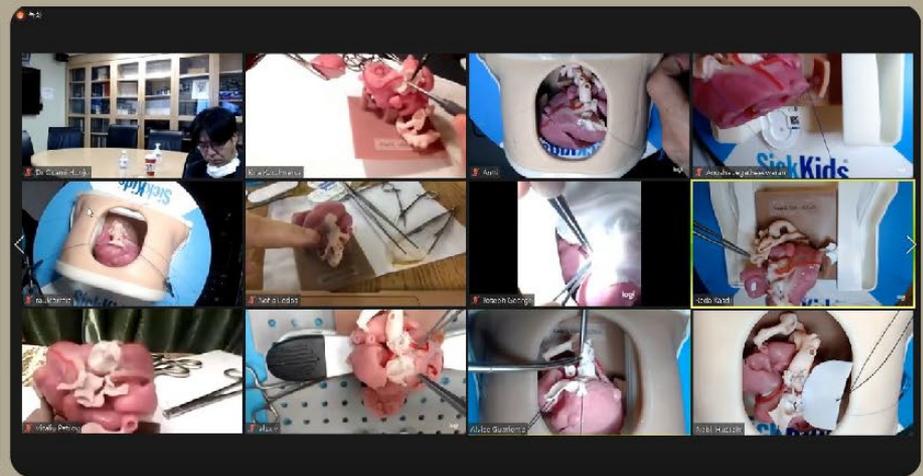
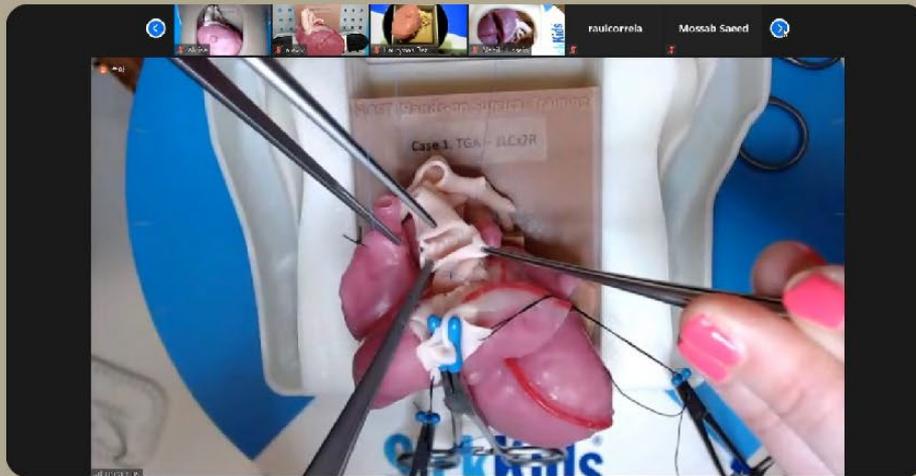


TGA 1LCx2R / 1L2RCx

Transposition of great arteries

On-line Course on Arterial Switch Operation

2020.11.28~29 / 12.05~06 – Hospital for Sick Children, Toronto, Canada



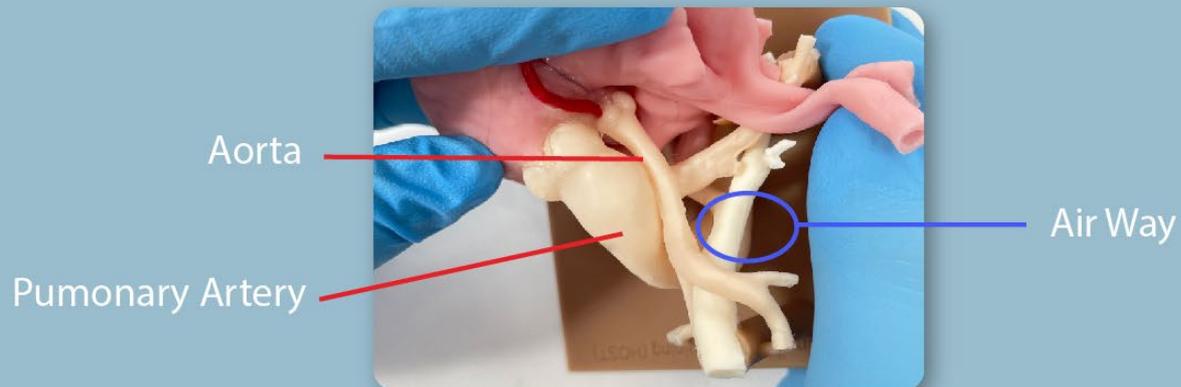
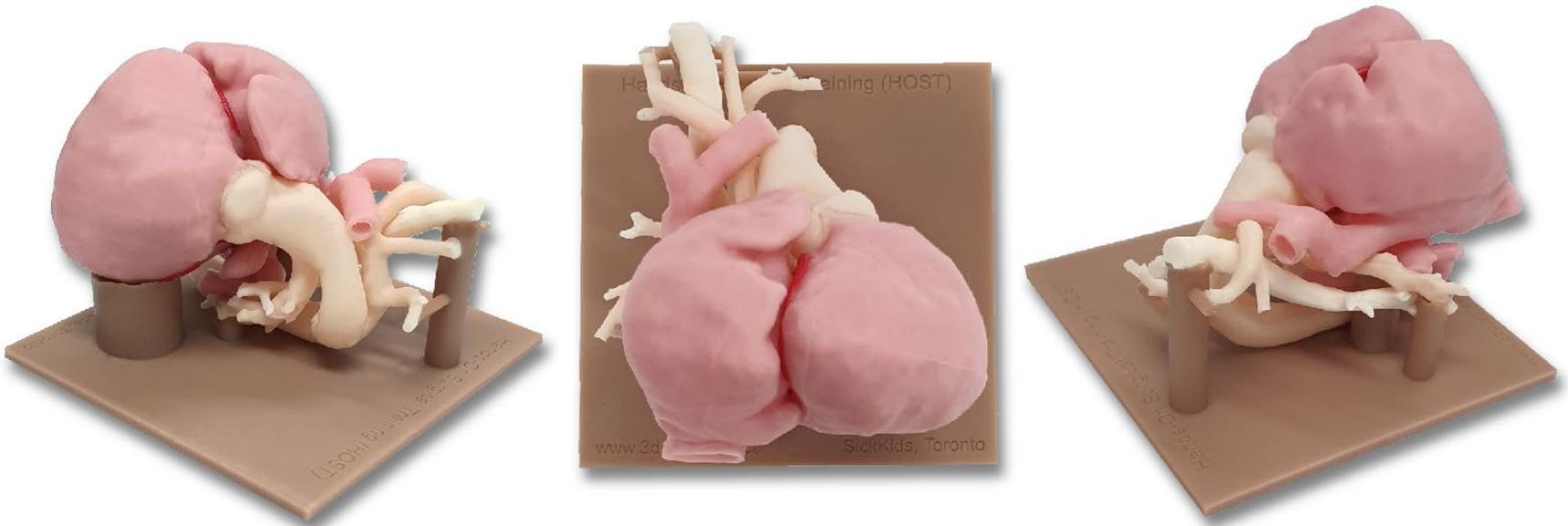
You can watch the video on YouTube!
-Demonstration of ASO on silicone model of TGA-

Demonstration

Arterial switch operation on silicone model of TGA

HLHS

Hypoplastic left heart syndrome

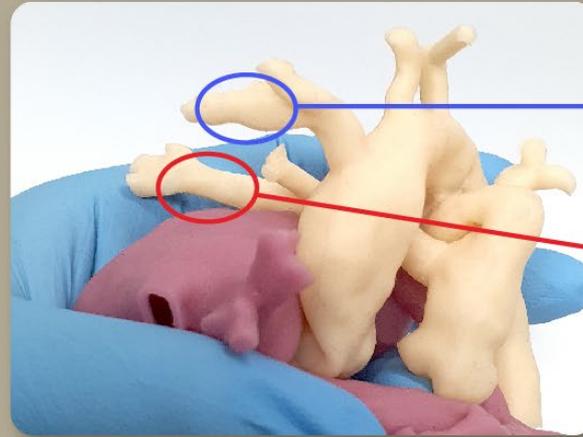


BT shunt (& BCPC)

Blalock - Toussing shunt



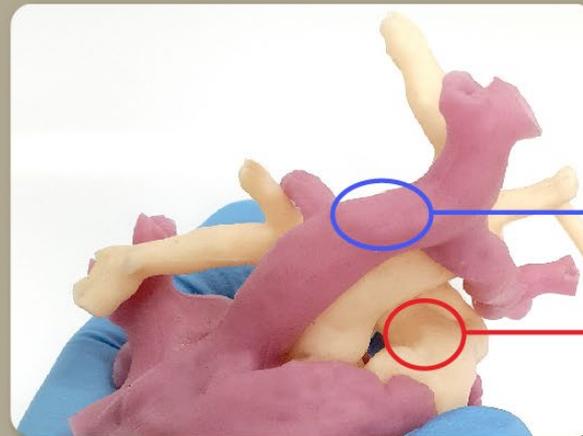
Blalock - Toussing shunt



Right
Subclavian Artery

Right
Pulmonary Artery

Bidirectional cavopulmonary connection

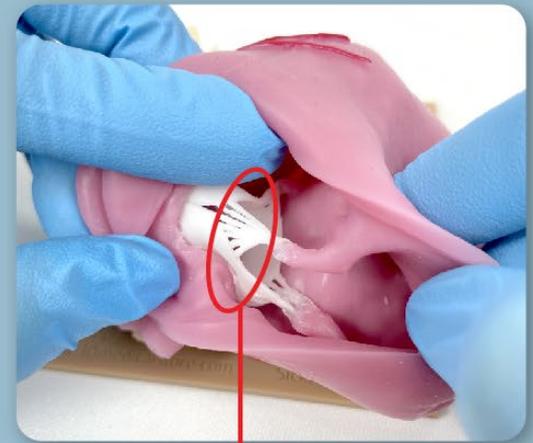
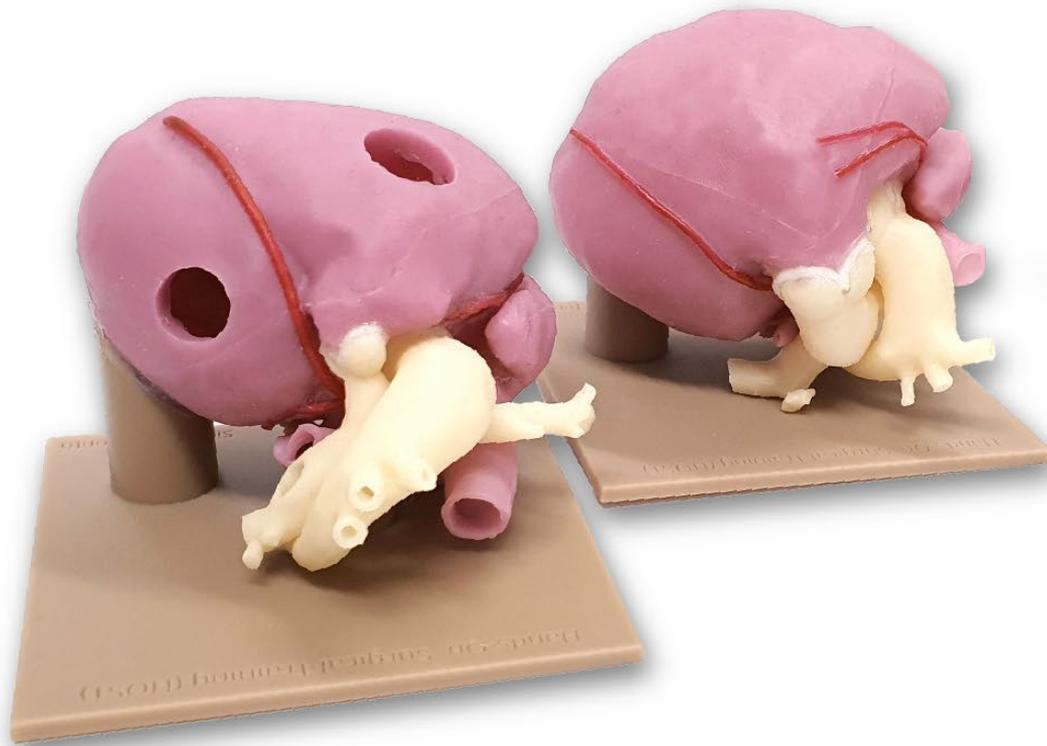


Superior Vena Cava

PA

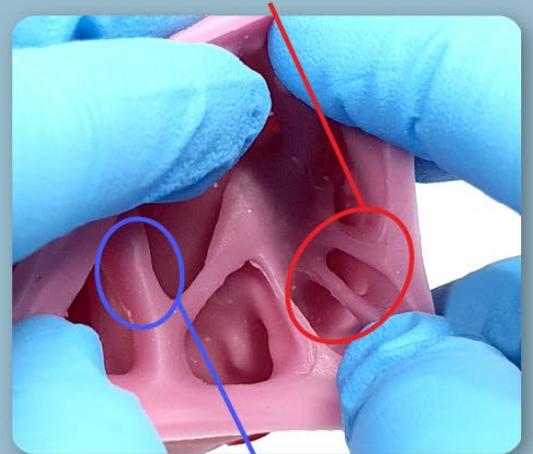
TOF with small PA / good PA

Tetralogy of fellot



Tendinous chords

Muscle bundles in RV outflow track



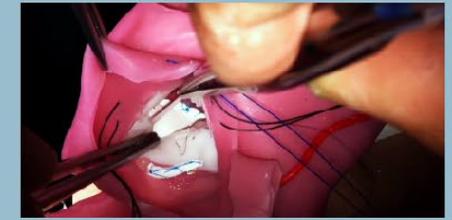
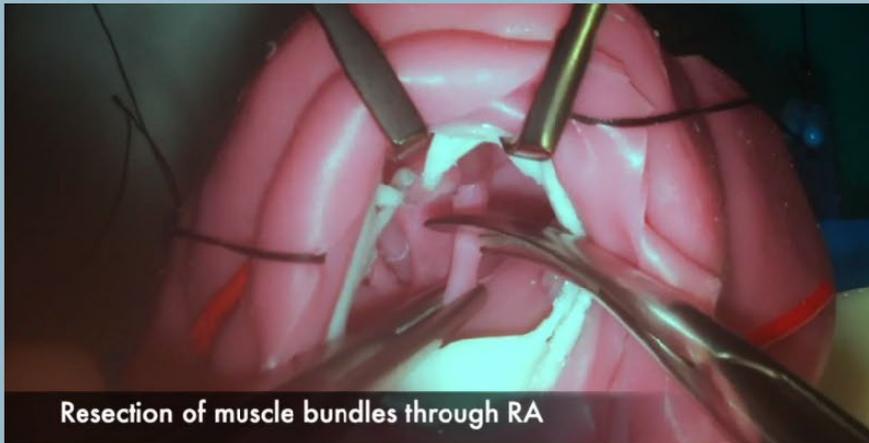
Moderate band

TOF with small PA / good PA

Tetralogy of fellot

Hands-On Surgical Training : TOF

2021.06.12 – Hospital for Sick Children, Toronto, Canada

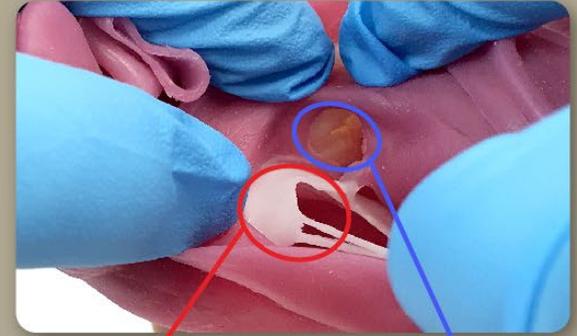


VSD Perimembranous / Doubly committed with holes

Ventricular septal defect



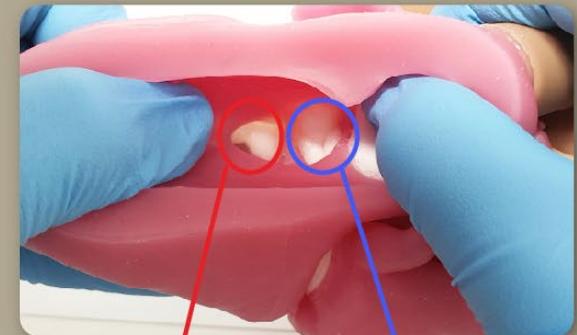
PM VSD (RV view)



Tricuspid valve

Aortic valve

SA VSD (LV view)



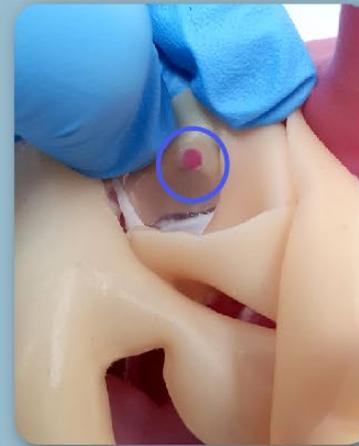
Pulmonary valve

Aortic valve

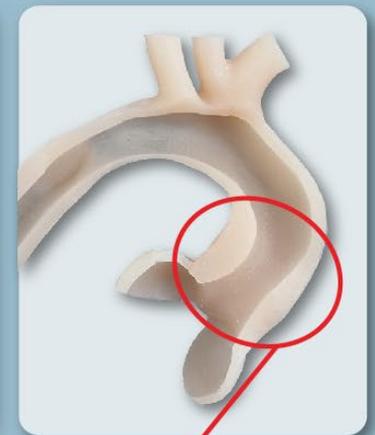
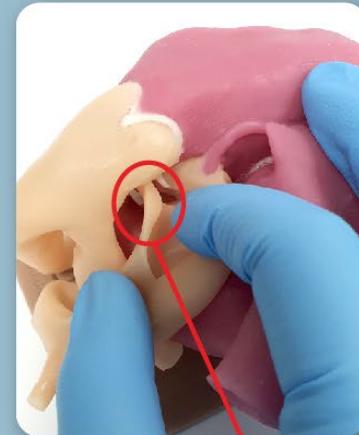
Supravalvar AS

Supravalvar aortic stenosis

H147 / with PA stenosis LKH



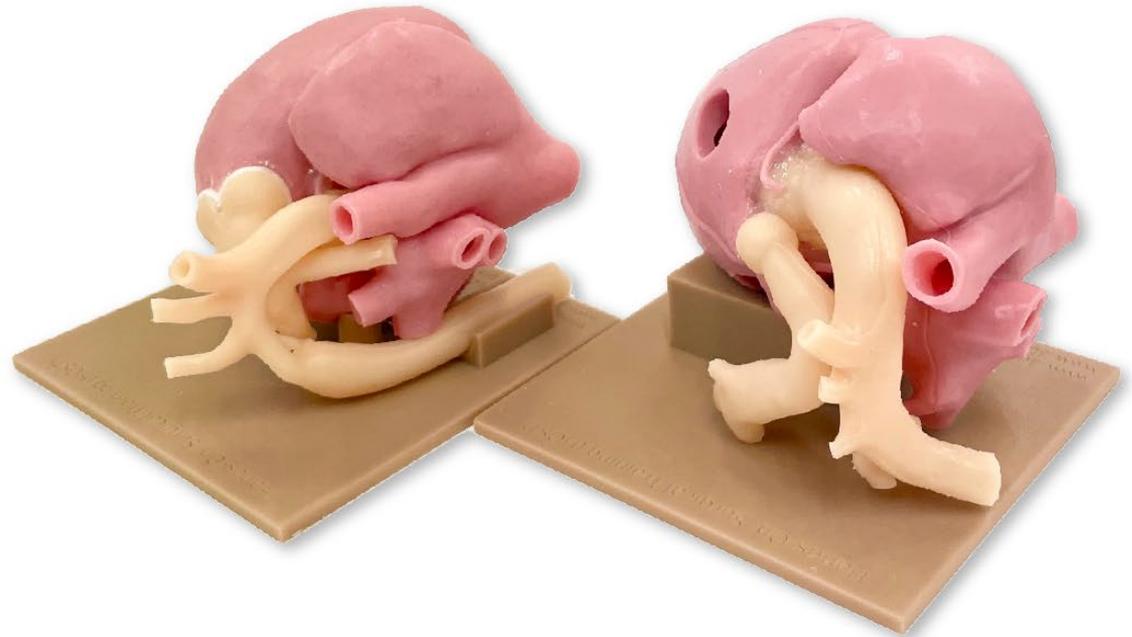
Location of the coronary artery as seen from inside the aorta



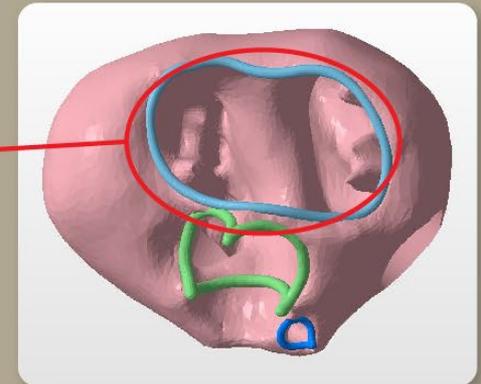
Aortic stenosis

AVSD / AVSD with TOF

Atrioventricular septal defect



Common
Atrioventricular canal

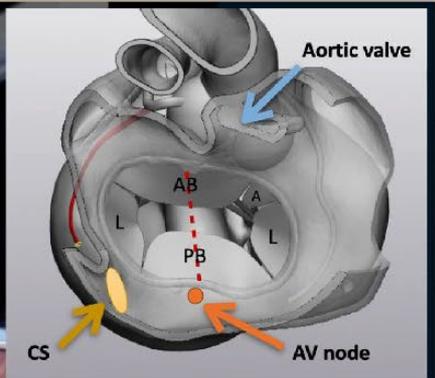
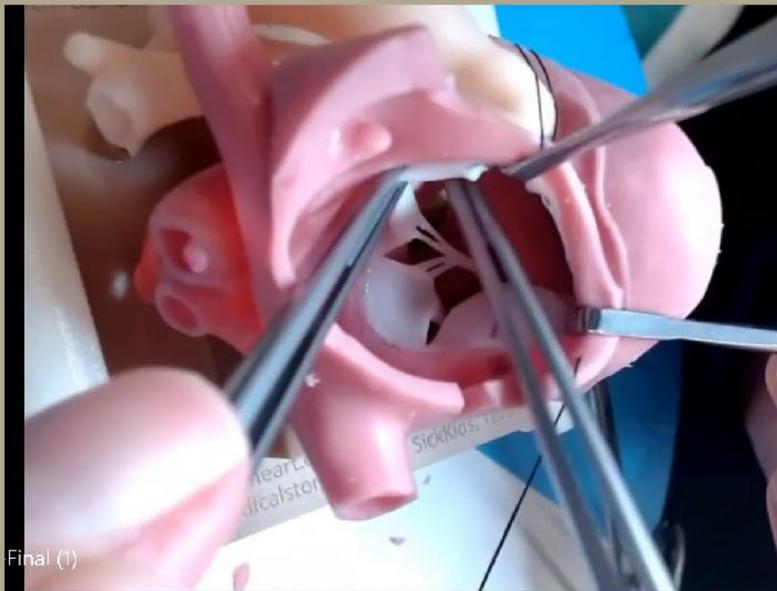


AVSD AVSD / AVSD with TOF

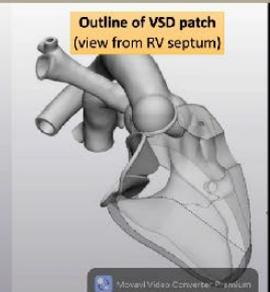
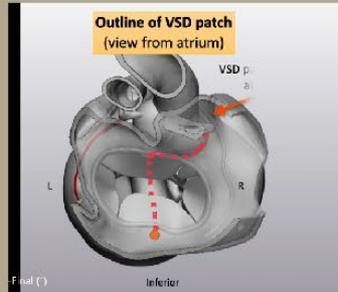
Atrioventricular septal defect

Hands-On Surgical Training : AVSD

2021.10.25 – Hospital for Sick Children, Toronto, Canada



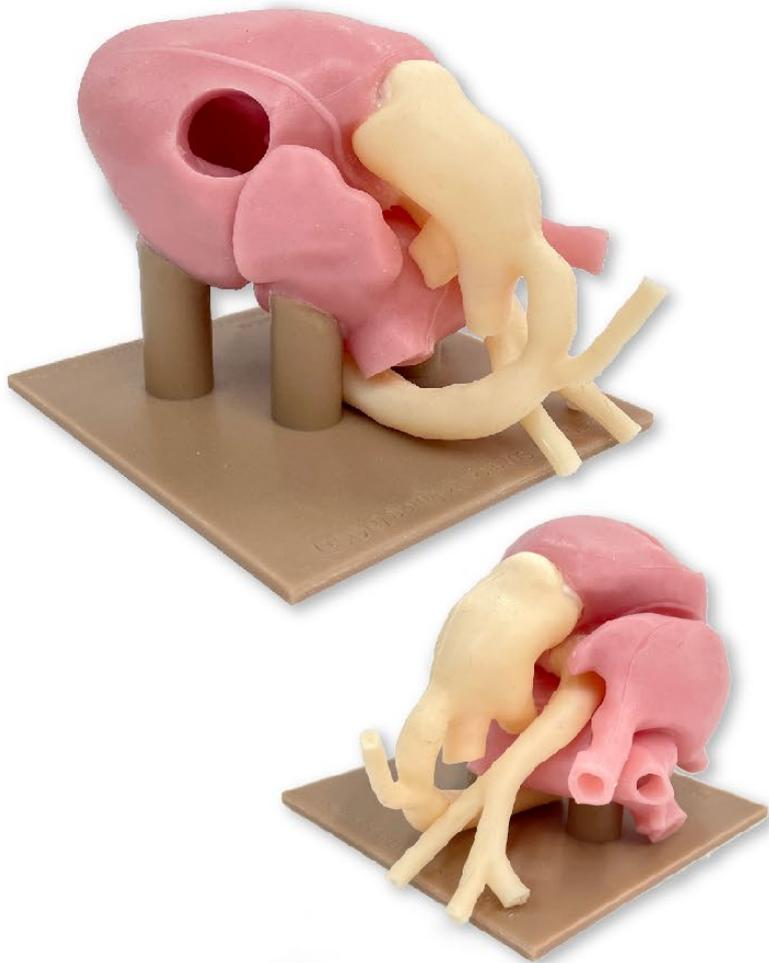
- Mark where anterior bridging leaflet (AB) and posterior bridging leaflet (PB) will be septated.
- The line should be **parallel with the interventricular crest (dash).**



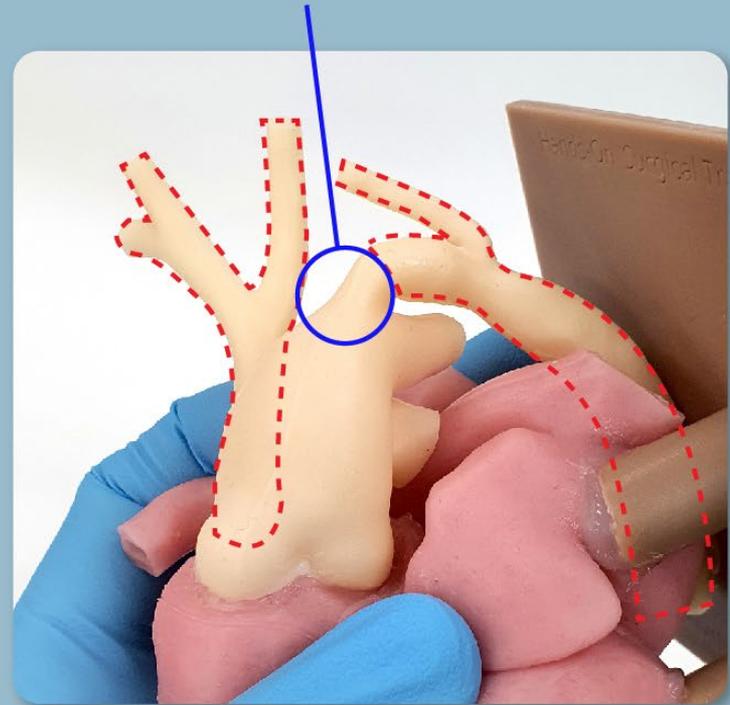
- Suturing VSD patch
- Suture **superior aspect of the patch** from the RV incision (optional)

Interrupted Aortic Arch

Interrupted aortic arch

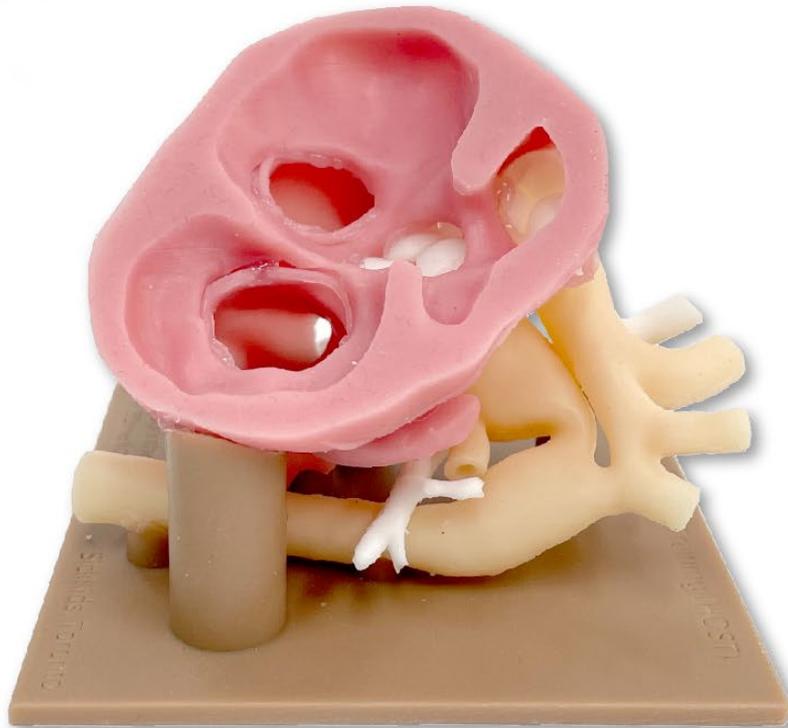


The Gap of interrupted aortic arch



DILV TGA COA

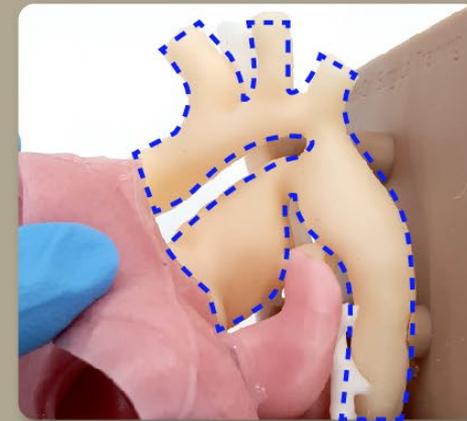
For NORWOOD Operation



Single or common ventricle

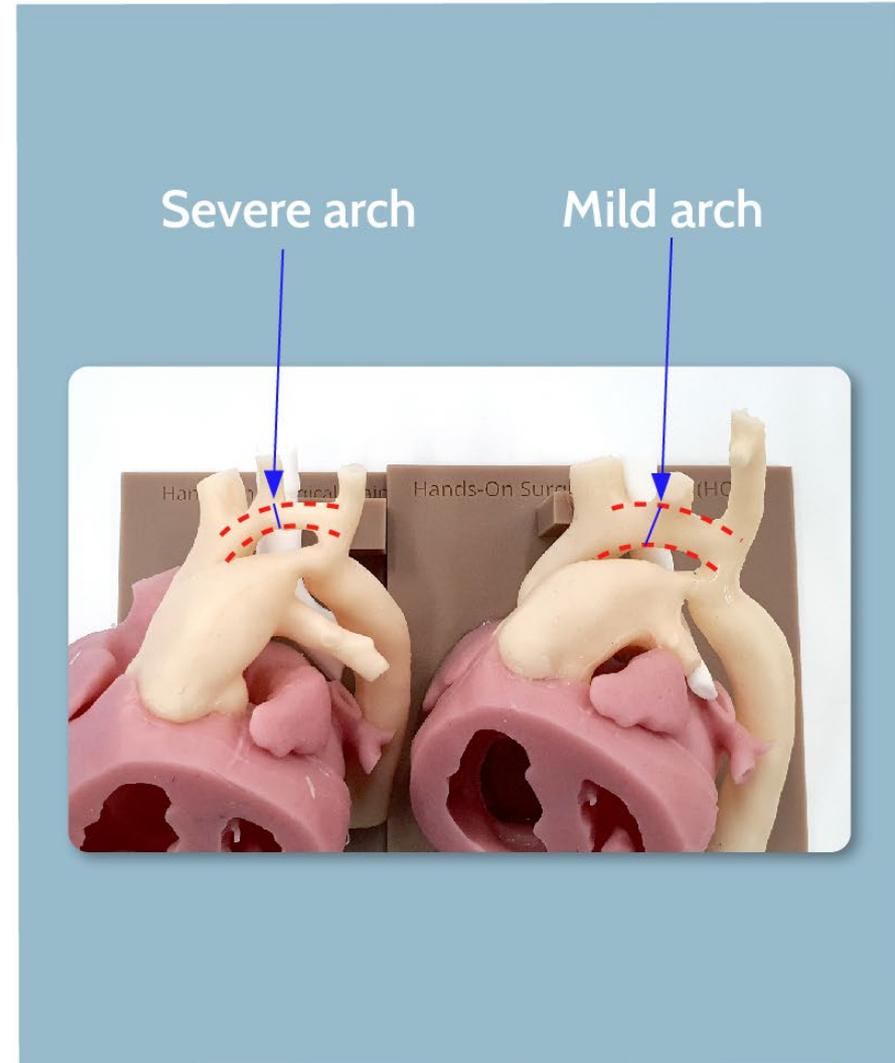
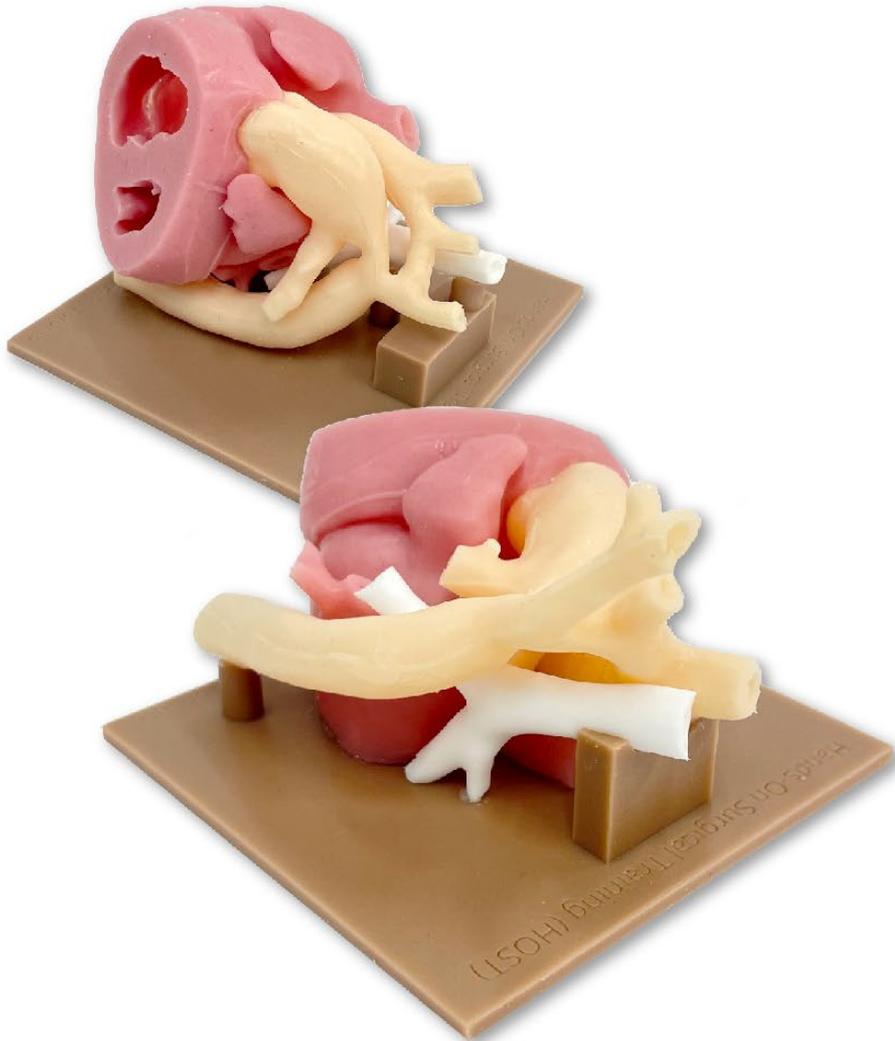


Single part Artery



COA

COA with mild arch hypoplasia / COA with severe arch hypoplasia
Coarctation of the aorta



CHD Model

Silicone heart model using 3D printed mold for CHD surgery training

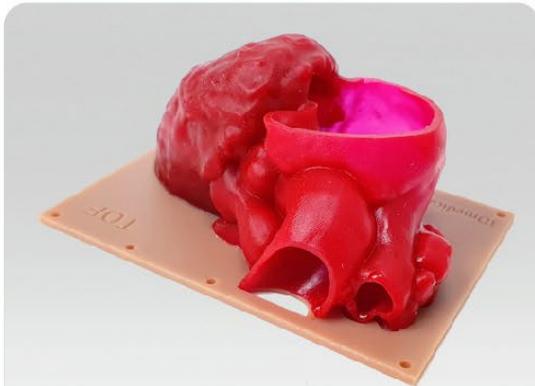
PREMIUM

- 1-1. TGA 1LCx2R
- 1-2. TGA 1L2RCx
2. BT shunt
3. HLHS
4. TOF small PA
5. TOF large PA
6. VSD perimembranous
7. VSD doubly committed
8. AVSD
9. Supravalvar aortic atenosis H147
10. Supravalvar aortic stenosis and PA stenosis
11. AVSD TOF
12. Interrupted aortic arch
13. DILV TGA COA for norwood operation
14. COA with mild arch hypoplasia
15. COA with severe arch hypoplasia
16. DORV 10 remote subaortic
17. DORV Taussig-Bing
18. DORV subaortic VSD
19. Ross-Konno operation
20. Corrected TGA for double switch
21. Truncus arteriosus
22. Corrected TGA VSD LVOTO
23. Subaortic and AV stenosis for modified Konno AVR
24. Bicuspid aortic valve stenosis for Ross or Ozaki
25. Fontan operation

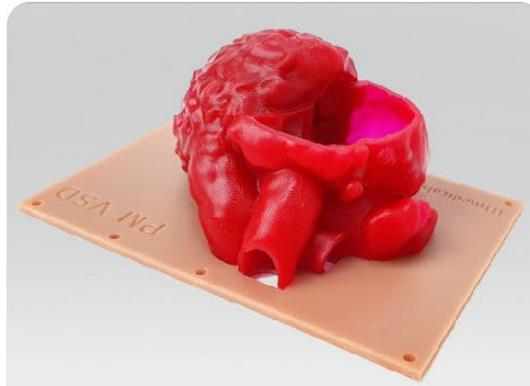


GENERAL PRODUCTS

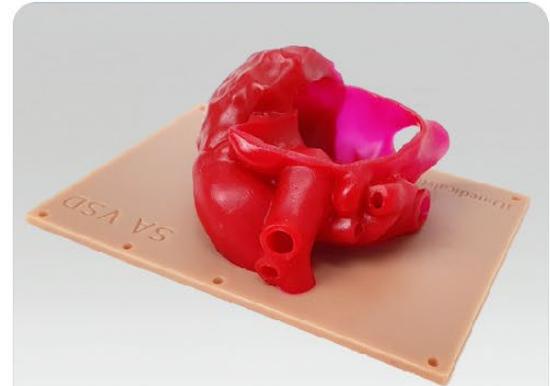
Silicone heart model using 3D printed mold for CHD surgery training



Tetralogy of fallot



Perimembranous VSD

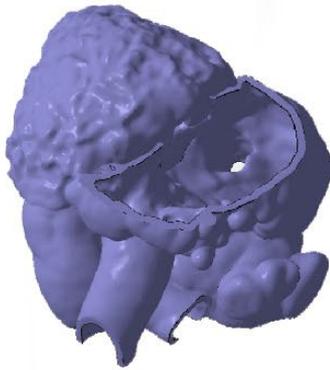


Subarterial VSD

- This is a general product that is provided at an affordable price.
- Within one year of development, it was adopted and used as an educational model for medical volunteering in 6 Asian countries including Nepal, Uzbekistan, and Vietnam.
- 7 more types are planned to be additionally developed.

TOF / PM VSD / SA VSD

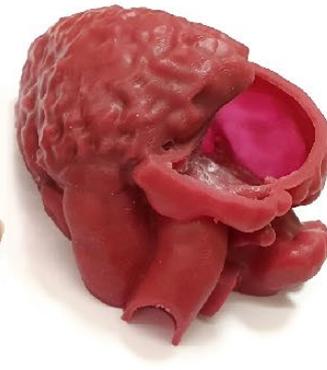
common features



CT based data



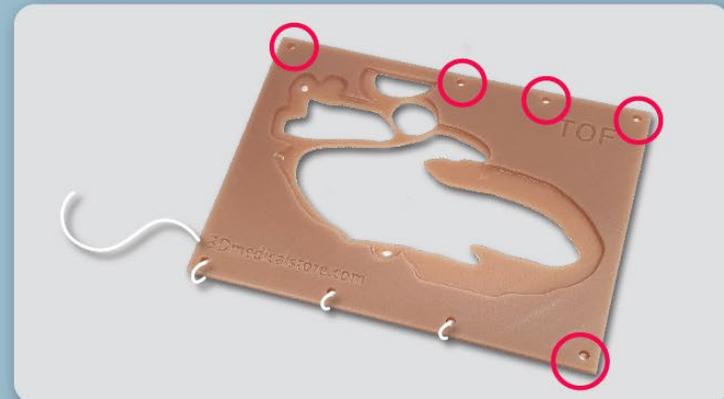
Verification through 3D printing



Silicone model



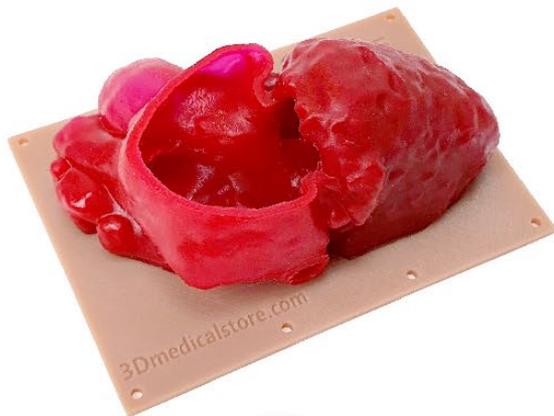
· Left ventricle open structure



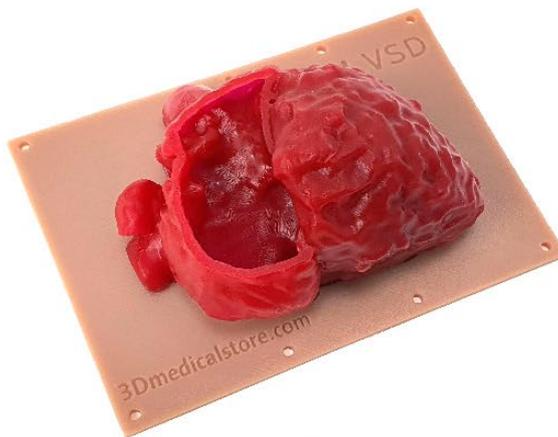
· possible to fix the plate to the bed through 8 holes

TOF / PM VSD / SA VSD

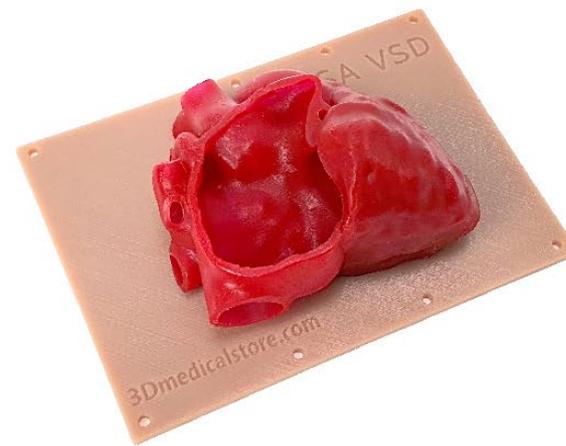
features by models



TOF



PM
VSD



SA
VSD



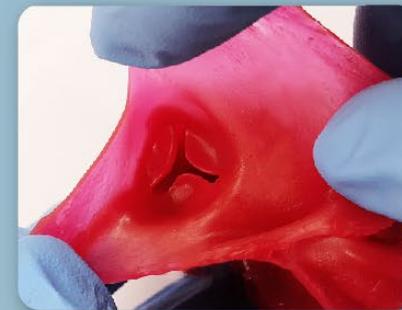
• Papillary muscle



• Tricuspid valve



• Aortic valve



• Pulmonary valve



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Medical R&D

Endoscope trainer

Common track Trainer



Lee, Gin-hyug

Title: Gastroenterologe,
Esophageal Cander

Designations: PhD, MD
Asan Medical Center



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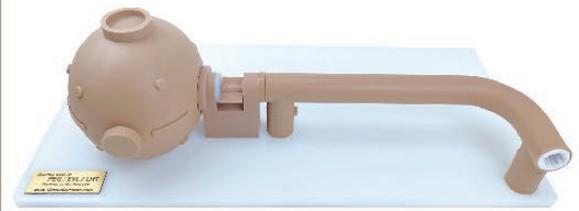
EVL (Esophageal Vericeal Ligation)



PEG (Percutaneous Endoscopic Gastrostomy)



LHT (Left Hand Trainer)



EVL Trainer with EVL Shell

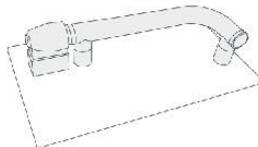


EVL Simulator
Designed by Gin Hyug Lee
www.3Dmedicalstore.com

EVL Components & Setting Guide

designed by Gin Hyug Lee
GLUCKMedical
www.3Dmedicalstore.com

EVL (Esophageal Vertical Ligation)



GLUCKMedical
www.3Dmedicalstore.com

Common Tools needed

Of these, the blue forceps are used to catch the suture, while the other ones are used to assist.

Components

1. Pink esophageal shell (to be sutured)
2. Green and red forceps (to catch the suture and the suture needle respectively)
3. Blue forceps (to catch the suture needle)
4. Red forceps (to catch the suture needle)

The suture needle is inserted into the shell, and the suture is pulled through.

Setup

The suture needle is inserted into the shell, and the suture is pulled through.



EVL (Esophageal Vertical Ligation) Model

The suture needle is inserted into the shell, and the suture is pulled through.

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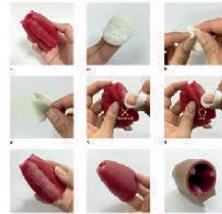
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The suture needle is inserted into the shell, and the suture is pulled through.



How to set EVL model

1. Insert the suture needle into the shell.
2. Pull the suture through the shell.
3. Secure the suture.
4. Repeat the process for the next suture.

If it is not possible to pull the suture through, check the suture and the shell.

The suture needle is inserted into the shell, and the suture is pulled through.

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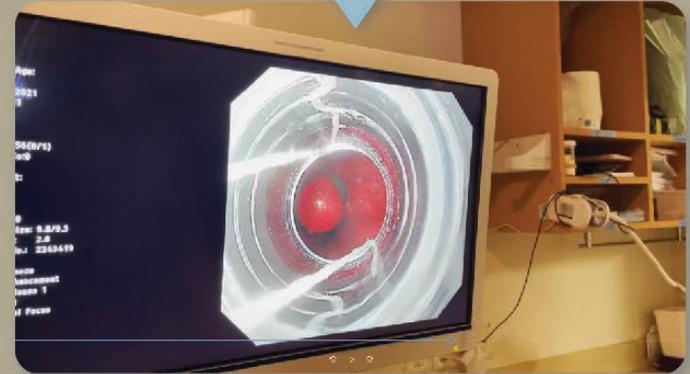
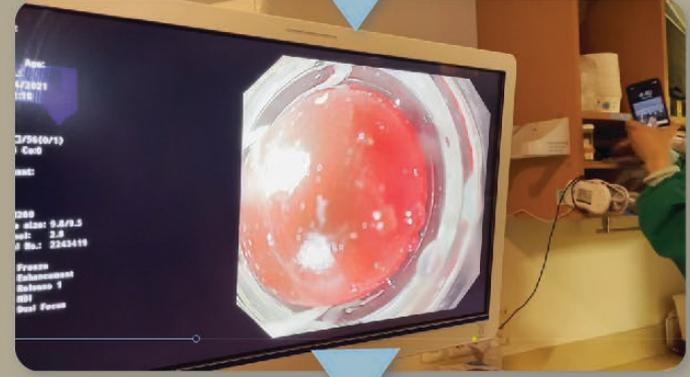
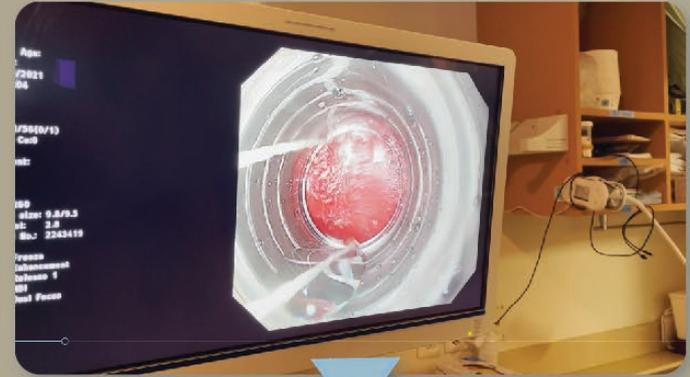


Test & Test & Test...

OK



NG



Skeleton Model

3D printed model

COMPONENTS

Skull, Mandible, Hand, Foot, Humerus, Ulna, Radius, Femur,
Tibia, Fibula, Pelvis, Spine (C1, C2, C7, T1, T12, L1, L5)

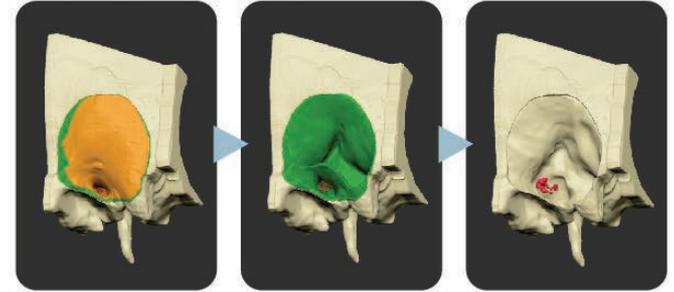
- Skeleton Model for Osteology Education.
- The parts necessary for learning were selected and designed to be portable.
- Manufactured only by 3D printing, it can be produced in various scales as needed.



Mastoid Model

3D Printed Model

Stages of structures according to hardness



Training with simple tools



- A model in which the hardness of each part of the bone is printed differently by adjusting the pattern of the structure
Air cell - Koener septum - Cortical bone, Ossicle
- Drilling can be replaced by using only simple tools, which increases the convenience of learning.
- The pattern structure can be used to produce customized models for various surgery such as CAA(Congenital aural atresia) operation.

번호	용도/시간	특징
1	10분	1. 뼈의 구조를 쉽게 이해할 수 있다. 2. 뼈의 구조를 쉽게 이해할 수 있다. 3. 뼈의 구조를 쉽게 이해할 수 있다.
2	10분	1. 뼈의 구조를 쉽게 이해할 수 있다. 2. 뼈의 구조를 쉽게 이해할 수 있다. 3. 뼈의 구조를 쉽게 이해할 수 있다.
3	10분	1. 뼈의 구조를 쉽게 이해할 수 있다. 2. 뼈의 구조를 쉽게 이해할 수 있다. 3. 뼈의 구조를 쉽게 이해할 수 있다.
4	10분	1. 뼈의 구조를 쉽게 이해할 수 있다. 2. 뼈의 구조를 쉽게 이해할 수 있다. 3. 뼈의 구조를 쉽게 이해할 수 있다.
5	10분	1. 뼈의 구조를 쉽게 이해할 수 있다. 2. 뼈의 구조를 쉽게 이해할 수 있다. 3. 뼈의 구조를 쉽게 이해할 수 있다.

번호	용도/시간	특징
1	10분	1. 뼈의 구조를 쉽게 이해할 수 있다. 2. 뼈의 구조를 쉽게 이해할 수 있다. 3. 뼈의 구조를 쉽게 이해할 수 있다.
2	10분	1. 뼈의 구조를 쉽게 이해할 수 있다. 2. 뼈의 구조를 쉽게 이해할 수 있다. 3. 뼈의 구조를 쉽게 이해할 수 있다.
3	10분	1. 뼈의 구조를 쉽게 이해할 수 있다. 2. 뼈의 구조를 쉽게 이해할 수 있다. 3. 뼈의 구조를 쉽게 이해할 수 있다.
4	10분	1. 뼈의 구조를 쉽게 이해할 수 있다. 2. 뼈의 구조를 쉽게 이해할 수 있다. 3. 뼈의 구조를 쉽게 이해할 수 있다.

번호	용도/시간	특징
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번호	용도/시간	특징
1	10분	1. 뼈의 구조를 쉽게 이해할 수 있다. 2. 뼈의 구조를 쉽게 이해할 수 있다. 3. 뼈의 구조를 쉽게 이해할 수 있다.
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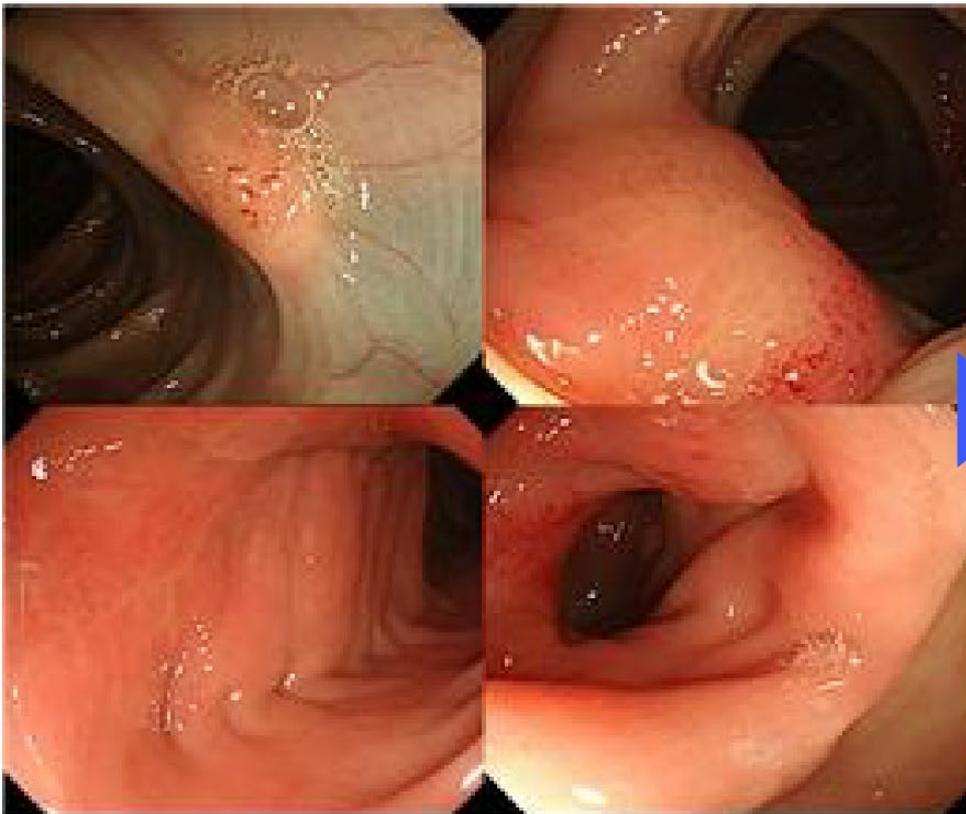
Simulator / Phantom

Simulator for EGDC (Esophago-Gastro-Duodenoscopy) Training
: Endoscope Manipulation and Removal of Gastric Lesions Training available.

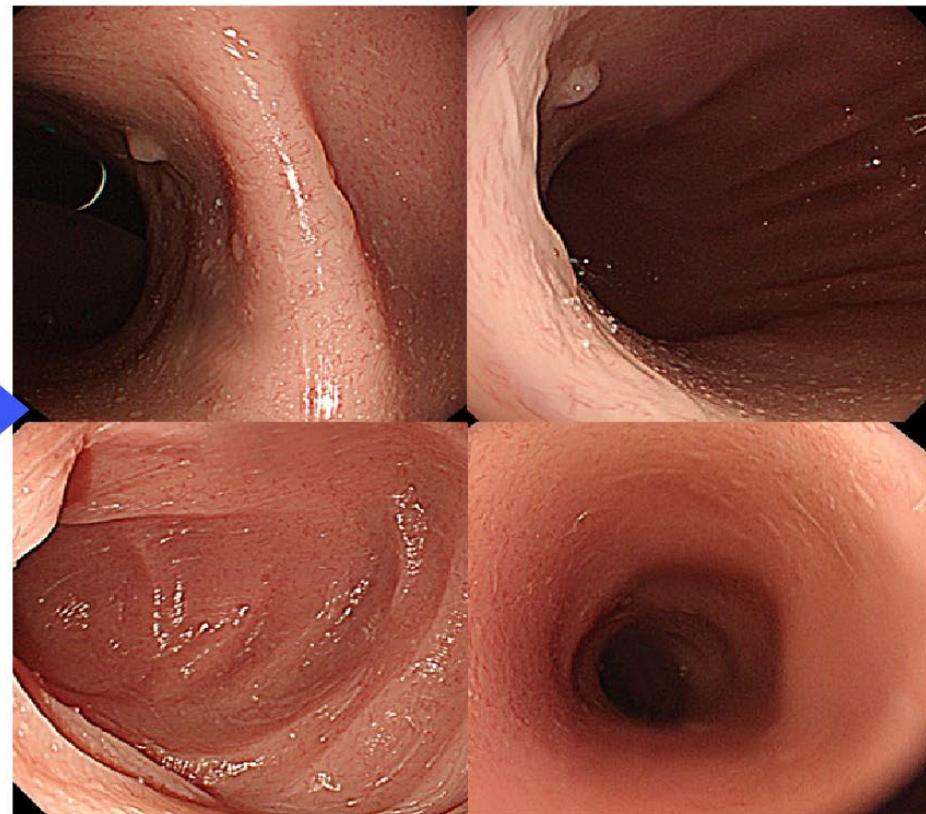


Simulator / Phantom

Real Body



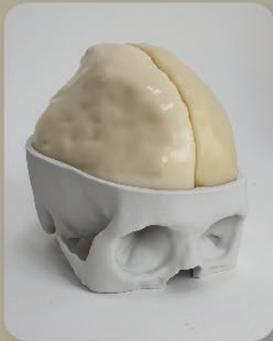
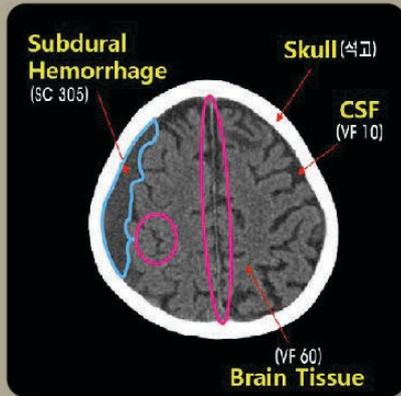
GLUCK EDG simulator



CT Phantom

with Seoul National University

Hemorrhage Phantom



Spine Phantom



Lungman Phantom



Simulator / Phantom

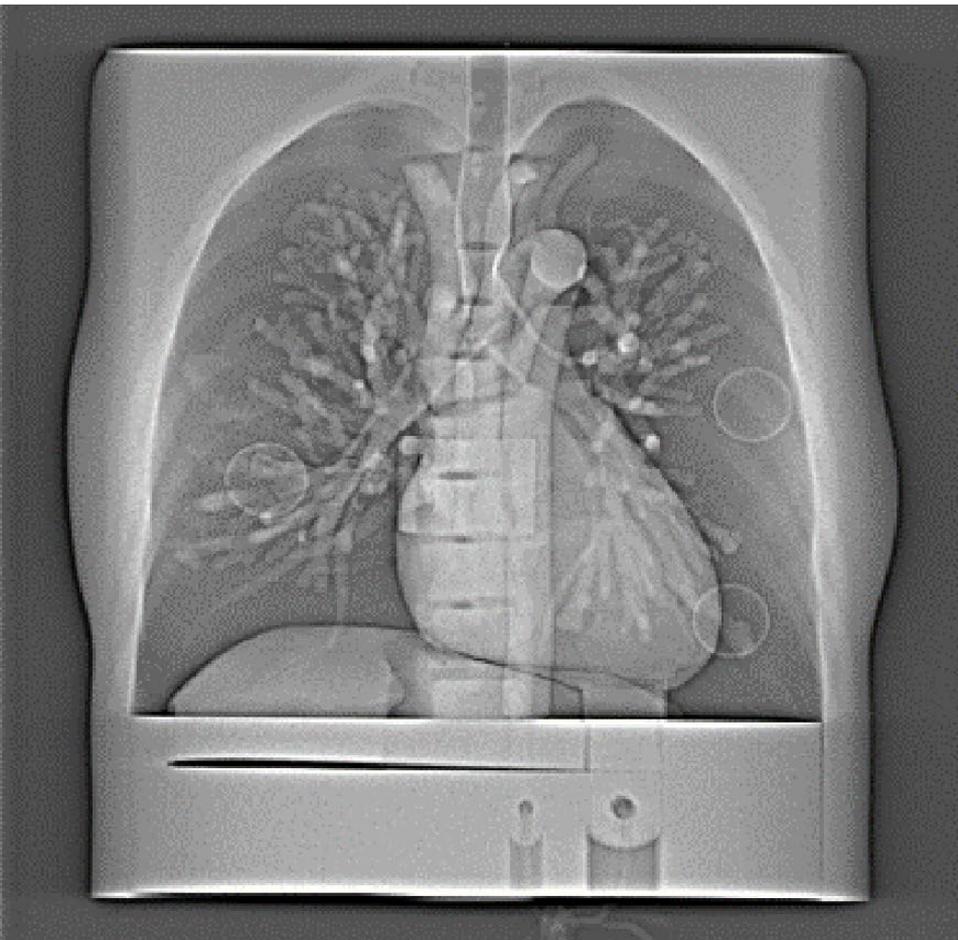
CT calibration Model

: Model for studying Radiation Exposure and disease conditions such as Covid, GGO, with the incorporation of damaged regions for disease modeling purposes.

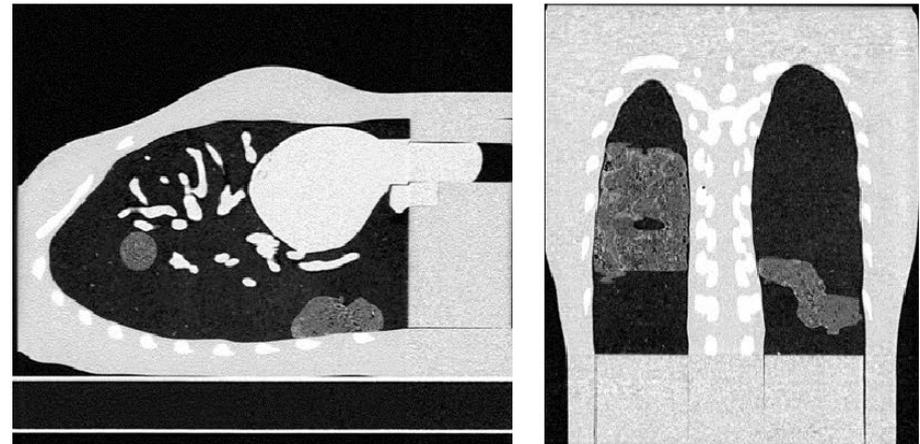


Simulator / Phantom

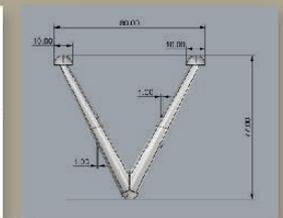
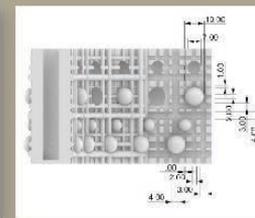
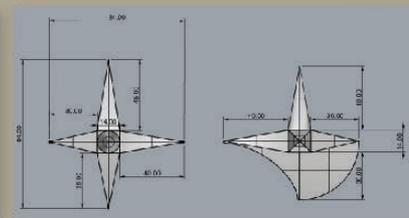
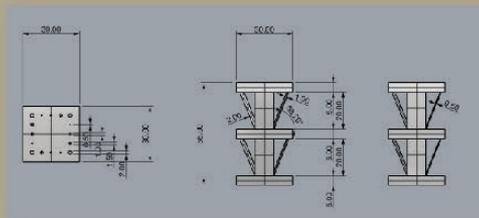
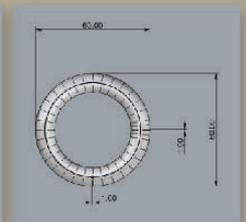
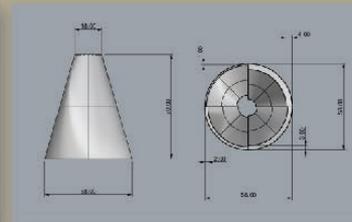
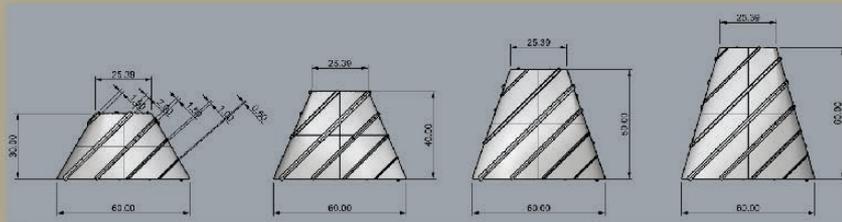
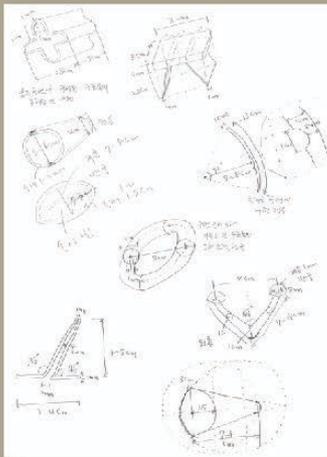
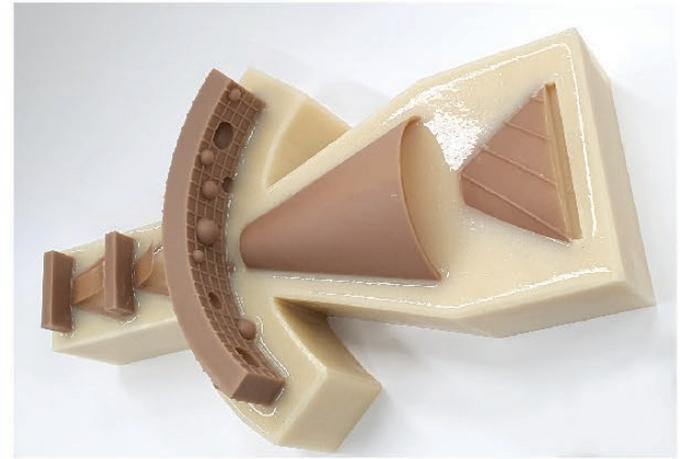
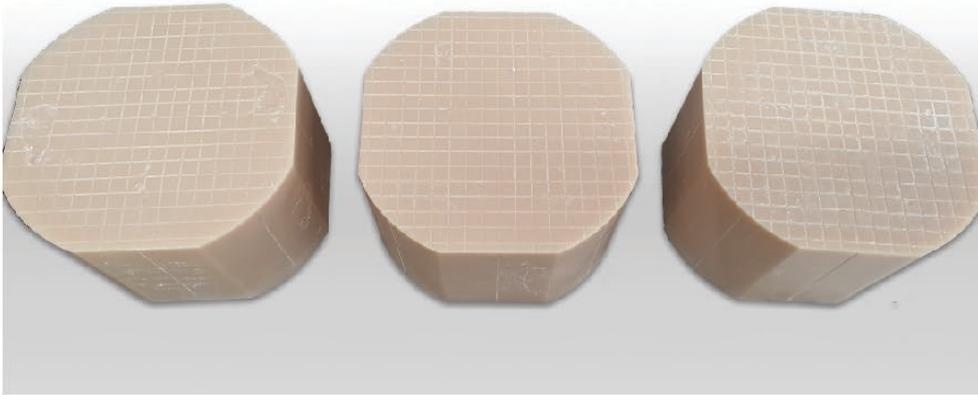
↓ Results of Lungman phantom CT imaging



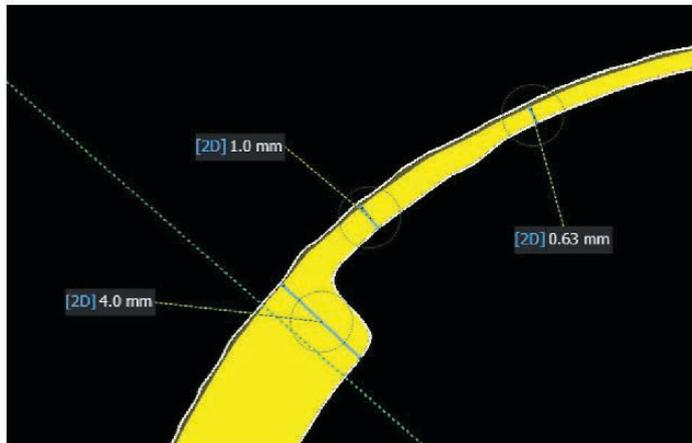
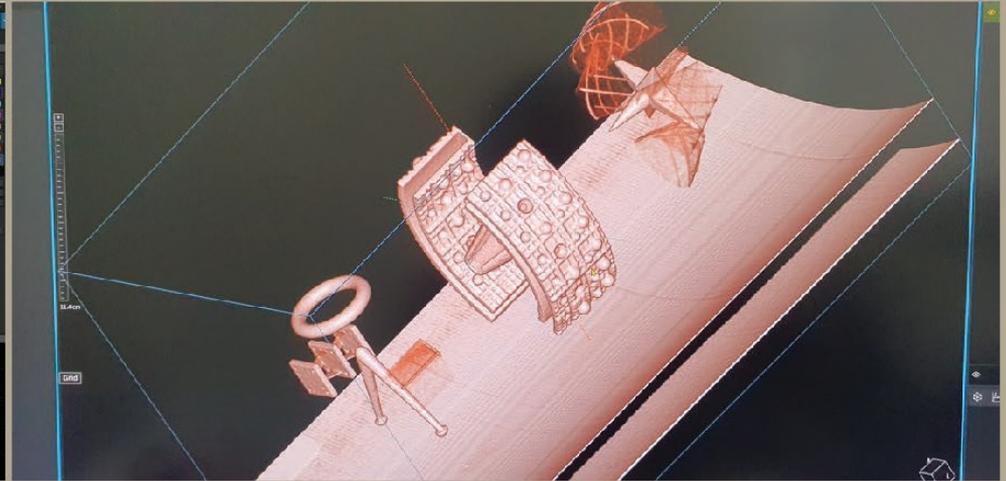
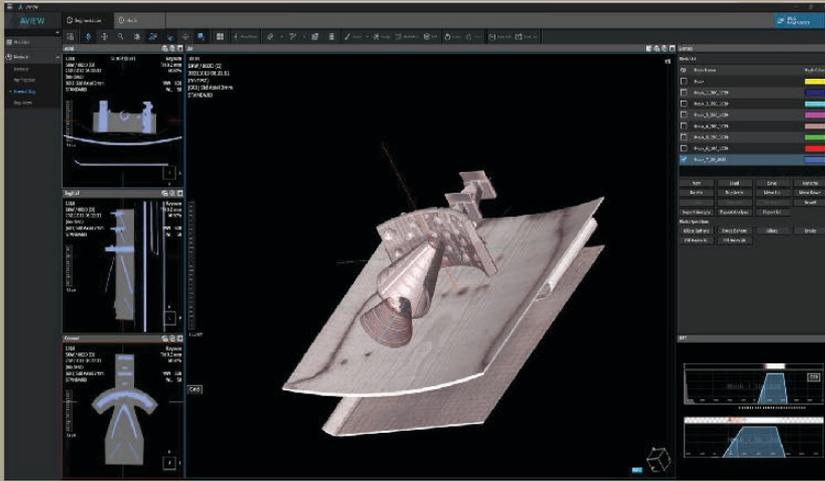
COVID-19 Disease Model



CT Phantom with ETRI

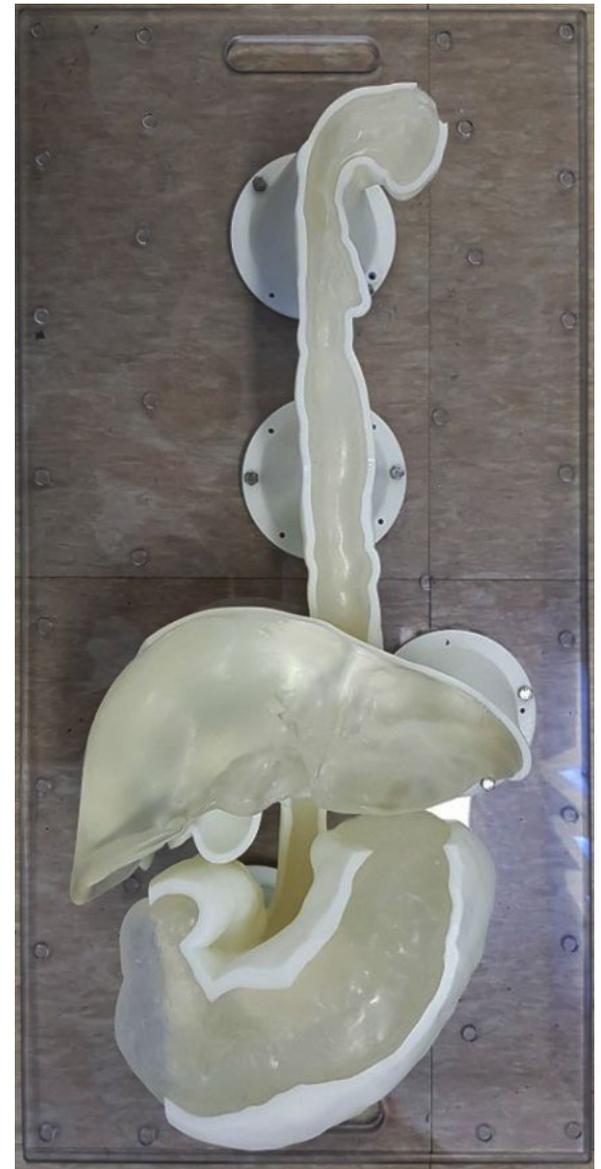
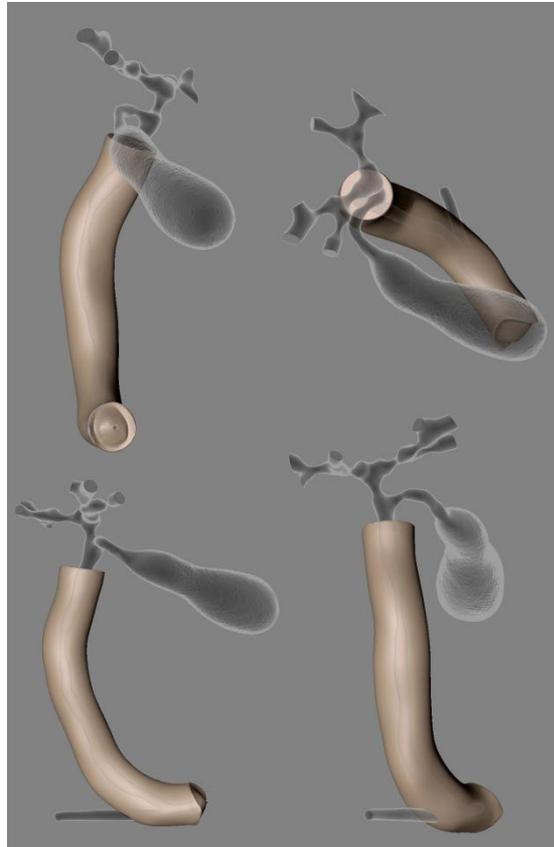


Test & CT Images



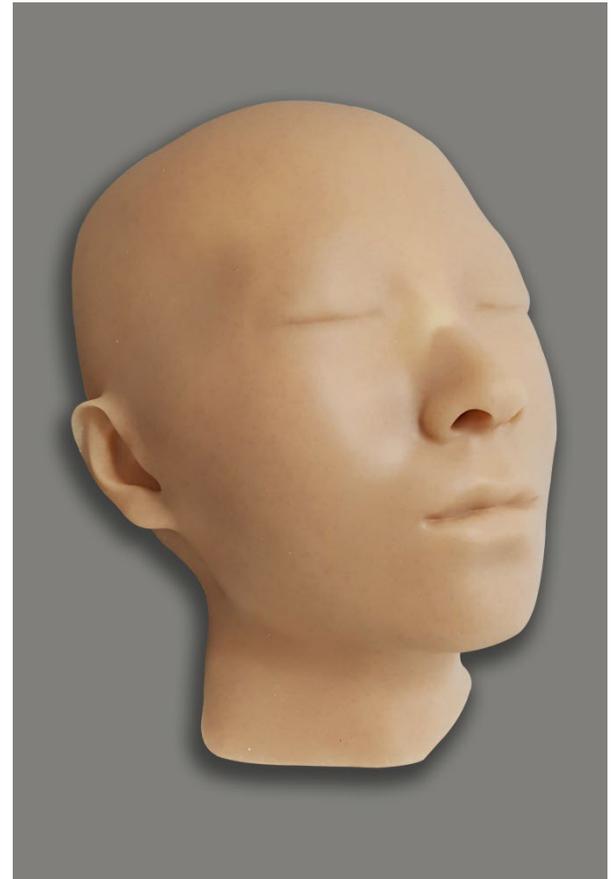
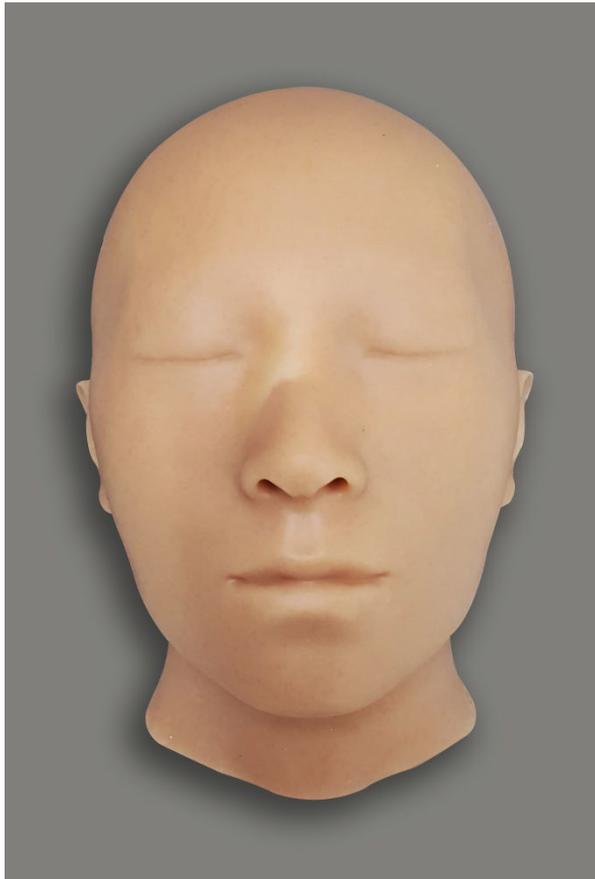
Simulator / Phantom

Simulator for Endoscopy



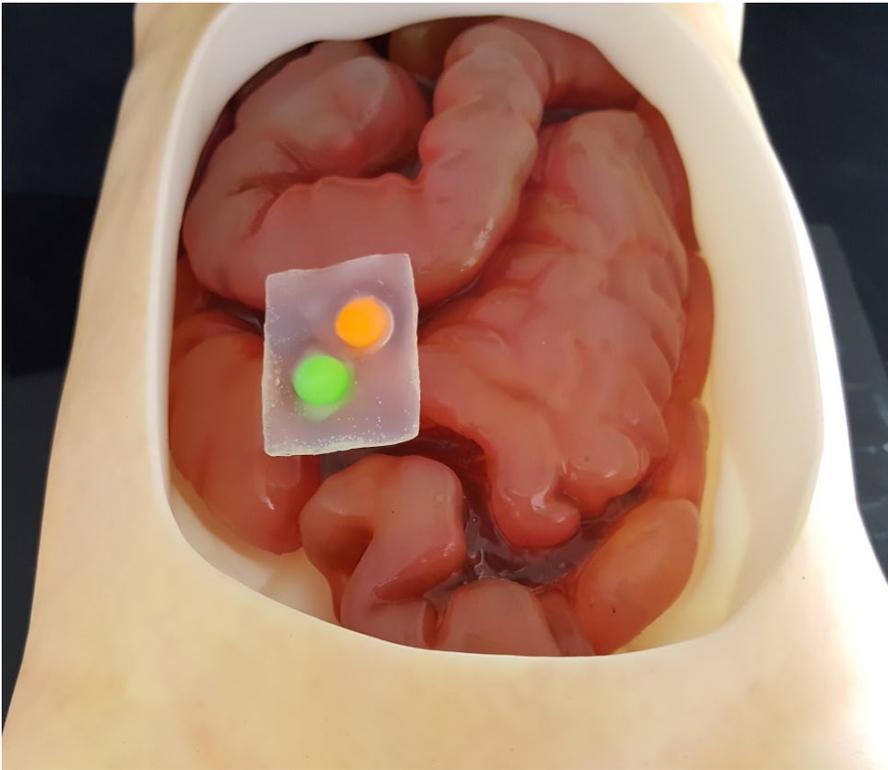
Simulator / Phantom

Dermal Fillers Simulator

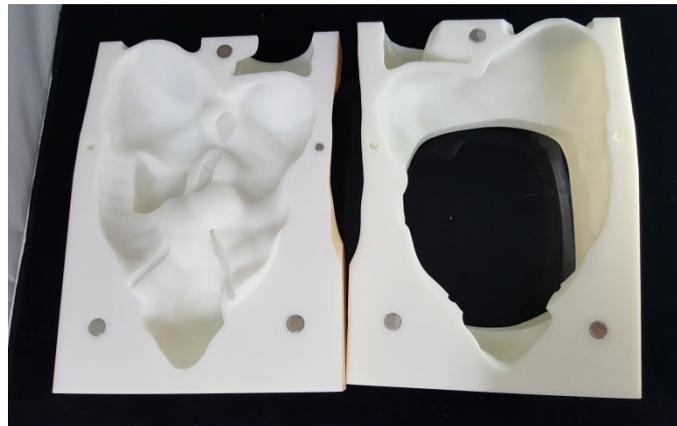
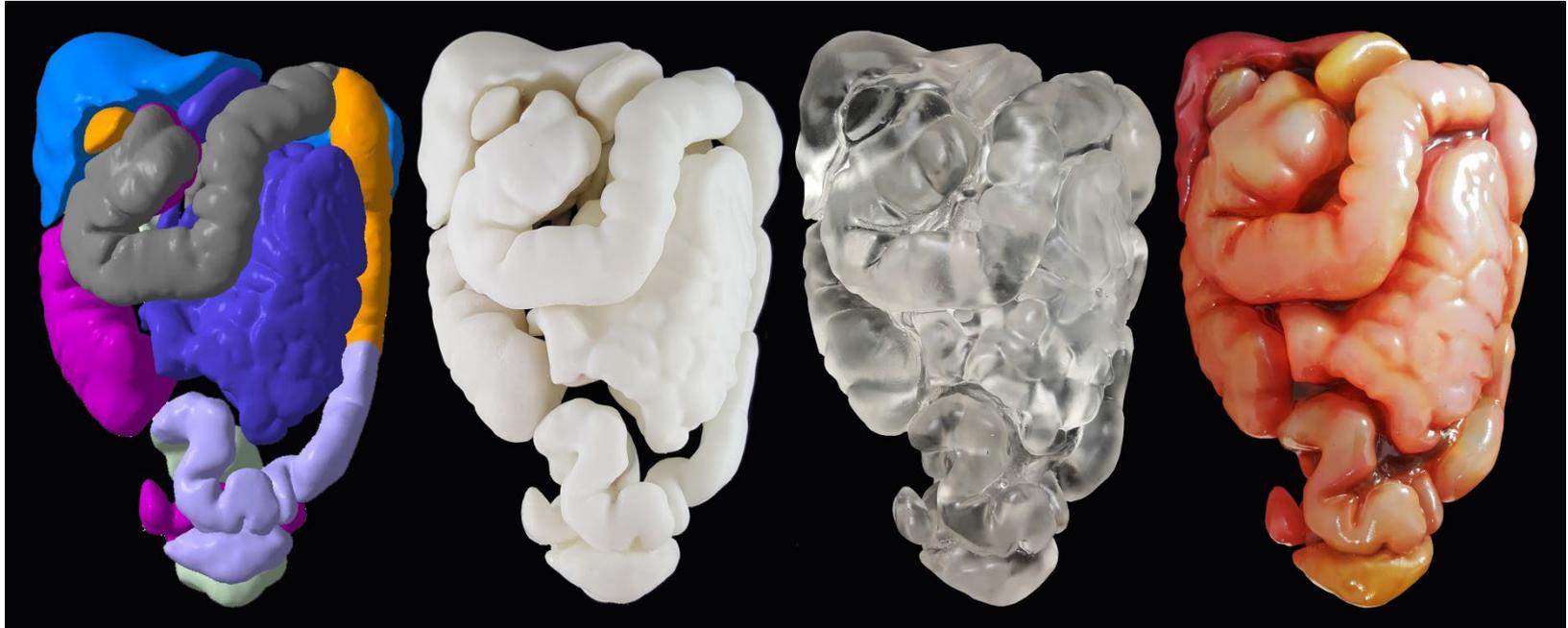


Simulator / Phantom

Peritoneal Carcinoma Phantom



Simulator / Phantom



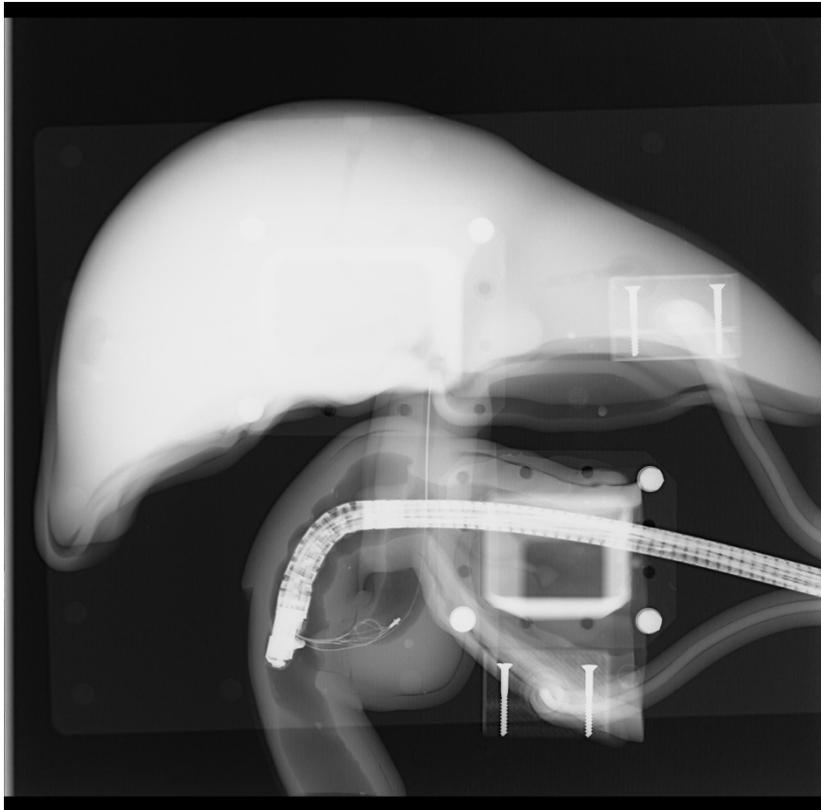
Simulator / Phantom

ERCP Phantom

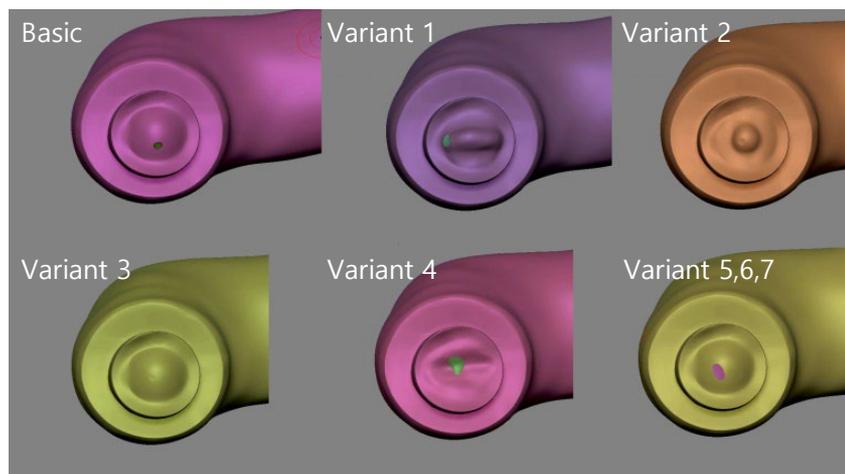
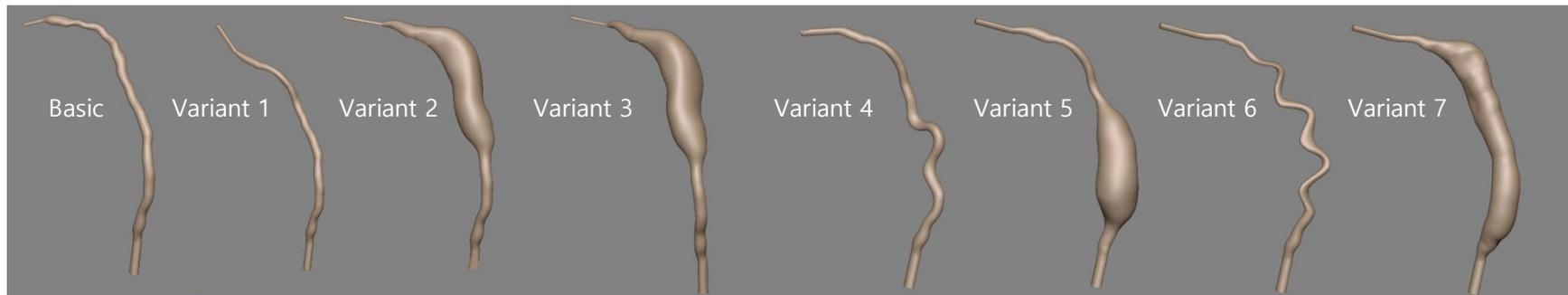


Simulator / Phantom

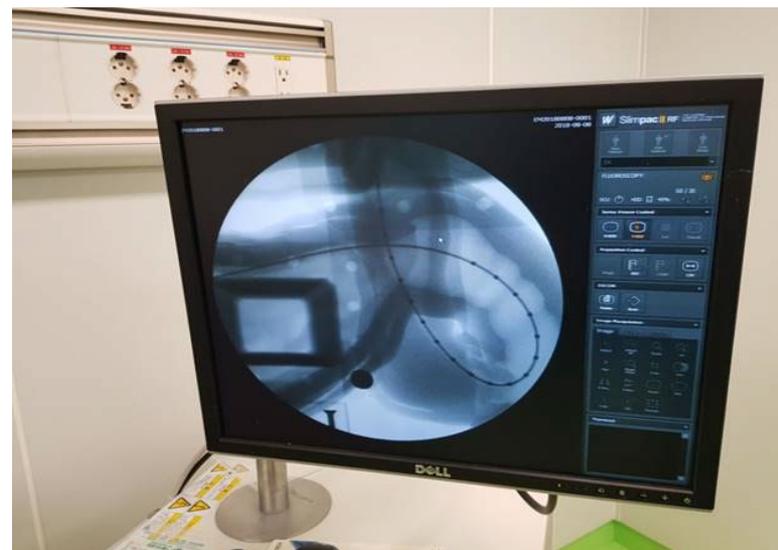
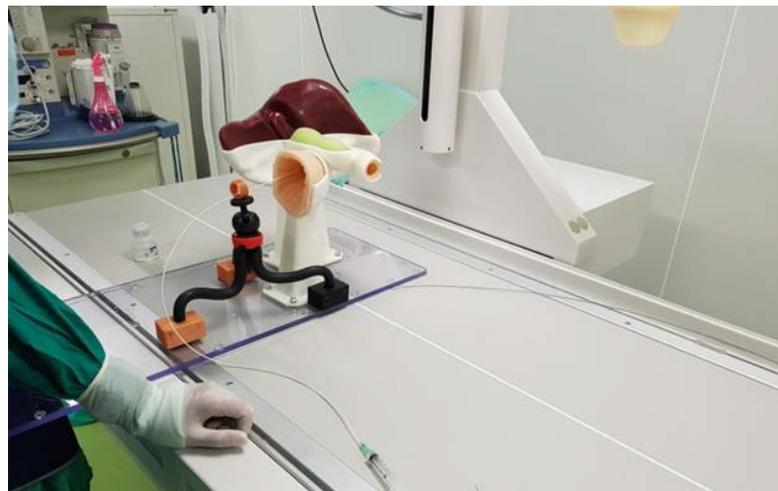
ERCP Silicone Phantom



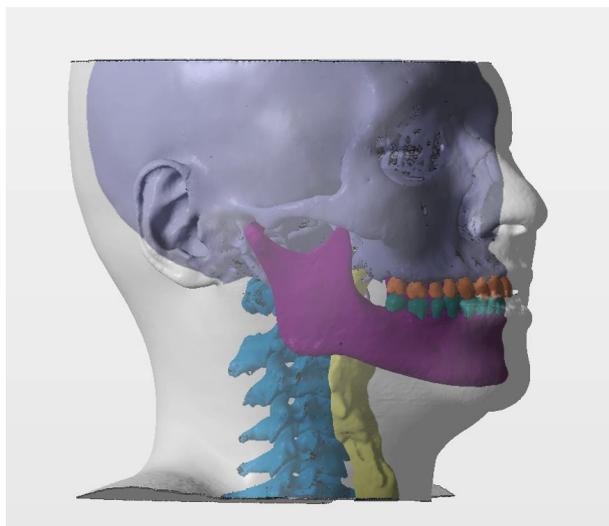
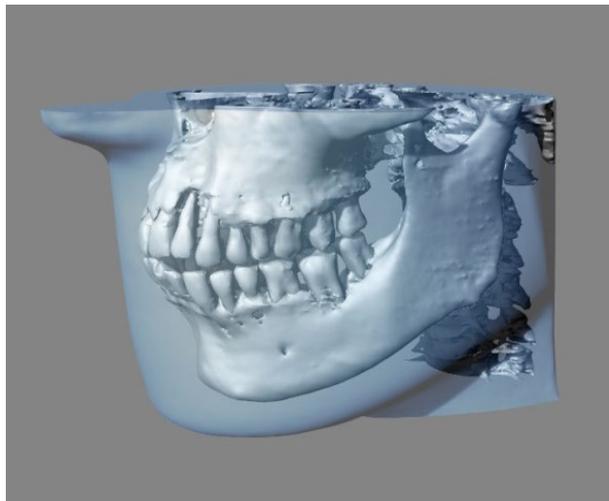
Simulator / Phantom



Simulator / Phantom



Simulator / Phantom



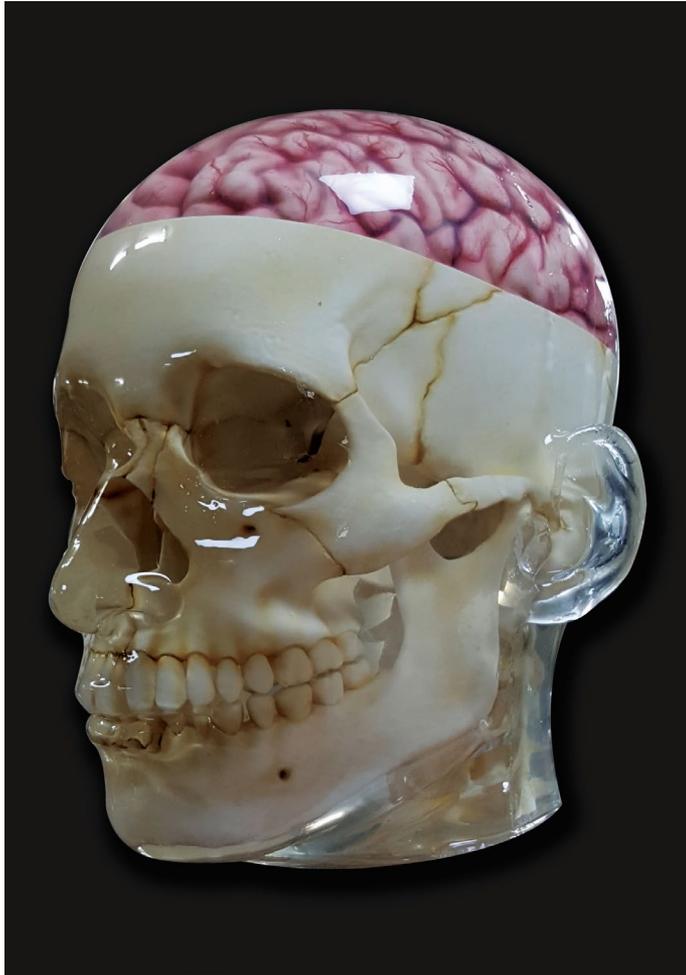
Medical Model



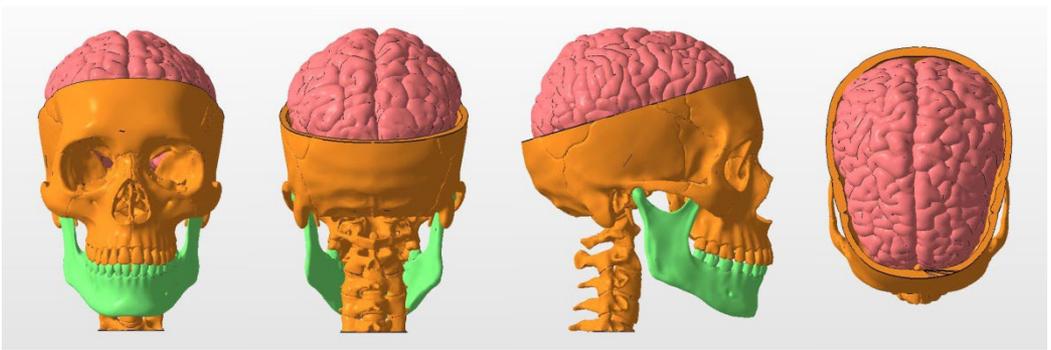
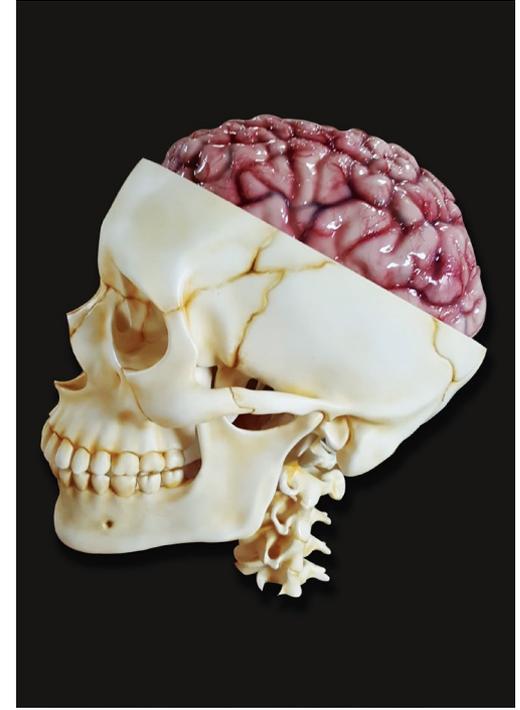
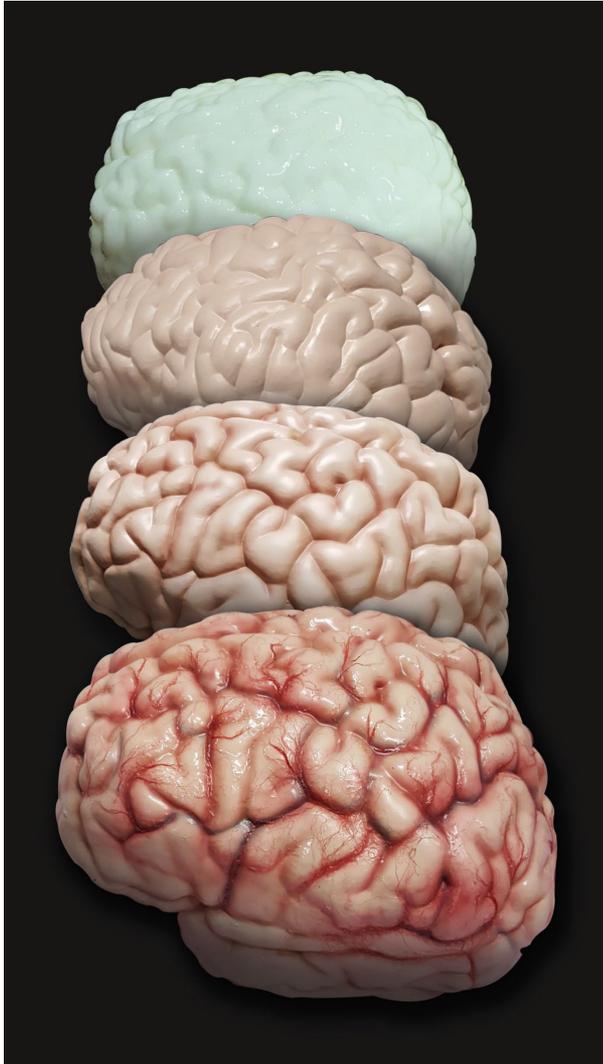
Medical Model



Medical Model



Medical Model



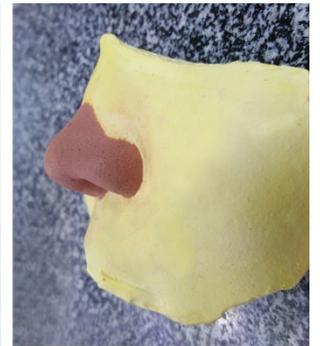
Medical Model - Prosthetics



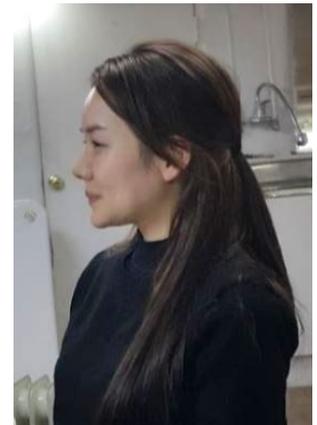
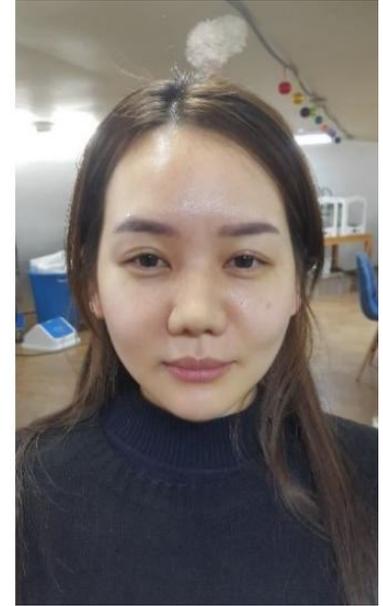
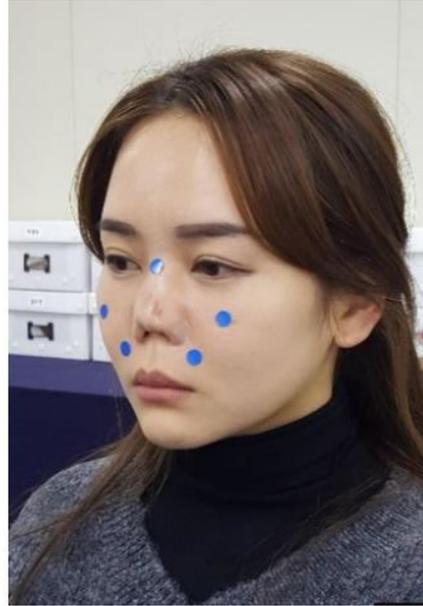
Medical Model - Prosthetics



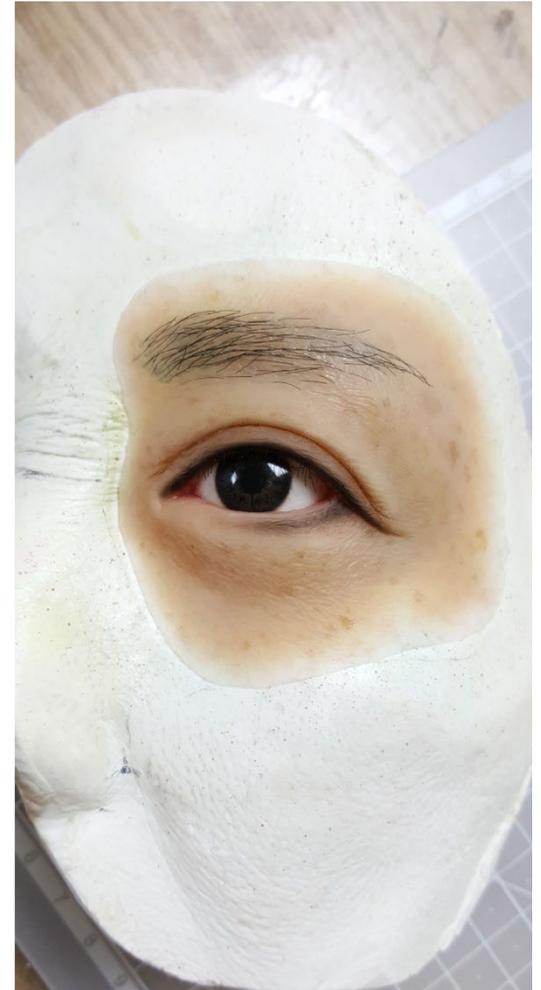
Medical Model - Prosthetics



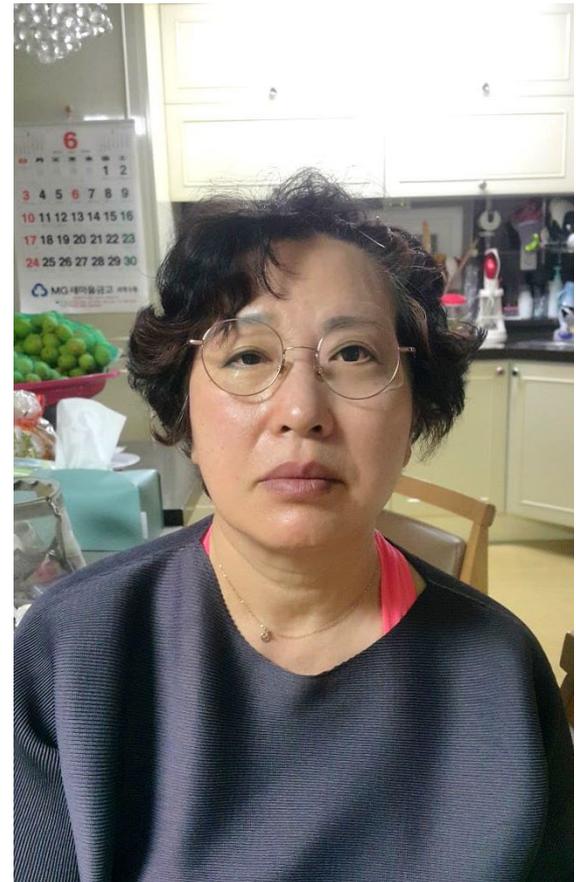
Medical Model - Prosthetics



Medical Model - Prosthetics



Medical Model - Prosthetics



Medical Model



Medical Model





Thank you

Hope lives in children's heart



MEDICAL
GLÜCK