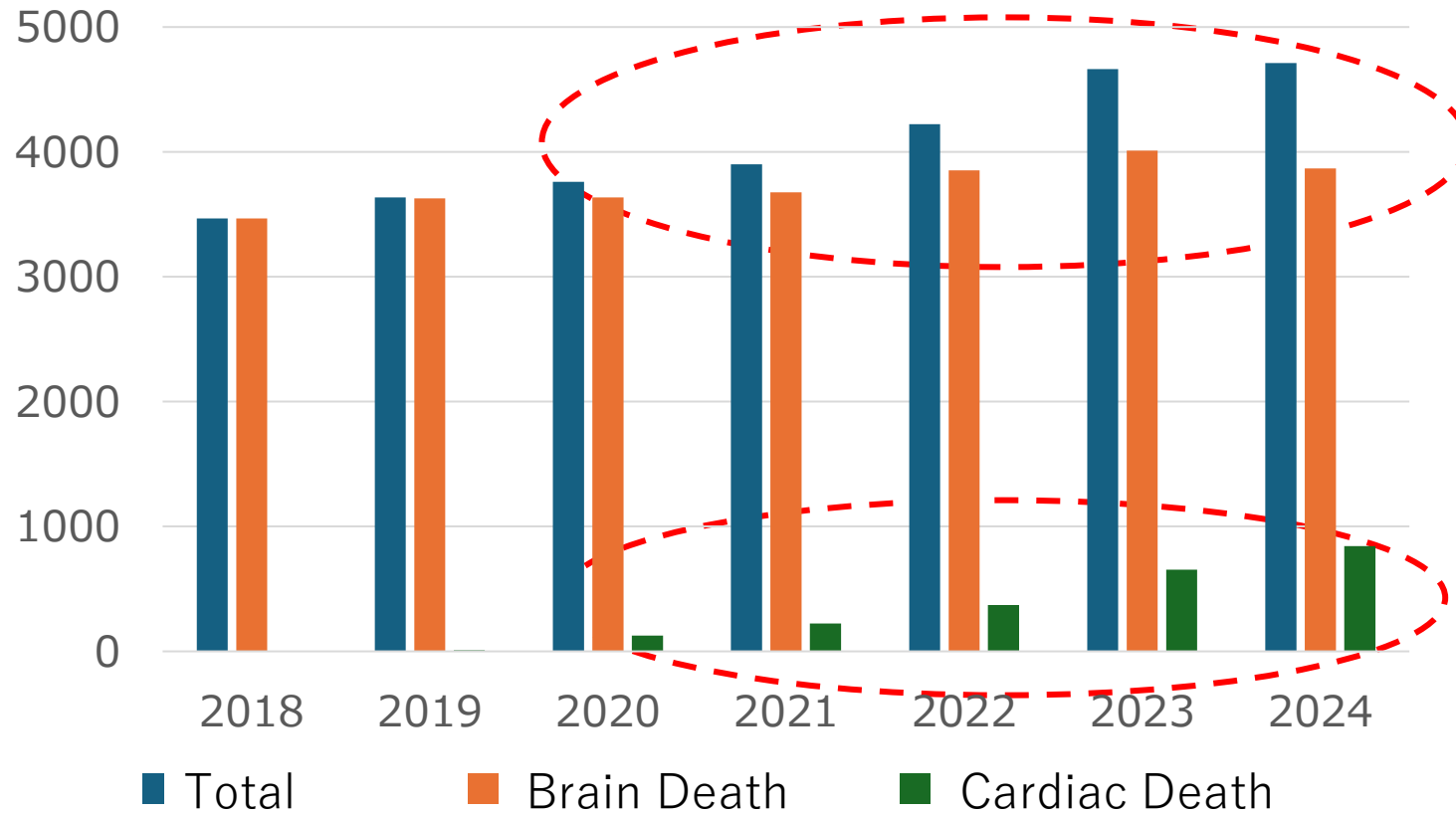


Boosting DCD Heart Transplantation with Ex Vivo Perfusion

Heart transplants in Japan are significantly fewer than in other countries due to limited brain-dead donors and regulatory barriers. Heart transplantation using hearts from circulatory death sources is highly anticipated; however, its domestic adoption remains slow due to technical challenges. Our group aims to develop an ex vivo perfusion system that enables reperfusion and functional assessment of DCD hearts. This technology holds great potential to contribute substantially to the clinical implementation of heart transplantation. We are currently seeking collaborative research partners.

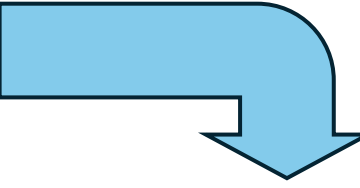
DCD Heart Transplants as a Promising Solution

Heart Transplant Numbers in the U.S.



	2018	2019	2020	2021	2022	2023	2024
DCD Transplant Rate(%)	0.0	0.2	3.4	5.7	8.8	14.0	17.9

Organ Procurement & Transplantation Network websiteより
(<https://optn.transplant.hrsa.gov/data/view-data-reports/national-data/>)



Debates on launching are advancing in Japan as well.

The Japanese Society for Transplantation

- DCD Ad Hoc Committee

The Japanese Society for Heart Transplantation

- DCD Promotion Committee

(**PI is a member of both committees.**)

Ethical issues are also solvable in Japan.

- Controlled DCD under Maastricht Category III is feasible.
- Based on the Guidelines for End-of-Life Care in Emergency and Intensive Care Medicine.

Making DCD Heart Transplantation Possible in Japan

DCD Heart Transplantation in other Countries

- Not Approved
- High Cost
- Cannot Assess Cardiac Function

Death
Diagnosis

High Potassium
Cardioplegic
Solution



Outside-the-Body Heart
Revival and Maintenance
for Transplant

Ref: TransMedics Official Website

Perfusion System Transport and Cardiac Function
Evaluation Under Beating Heart Conditions*

*Insufficient

Cardiac
Arrest

End-of-
Life
Care
Period

Thoracot
omy

Heart
Expl.

Heart
Transplant

Proposed Japan-Specific DCD Transplant Strategy

Death
Diagnosis

Original Myocardial Protection
Solution
(Patent Prep)

Original Myocardial
Perfusion Fluid
(Patent Prep)

Transport under Cardiac
Arrest Using a Cooler
Box

Original Perfusion &
Cardiac Function
Device
(Patent Pending)

Cardiac
Arrest

End-of-
Life
Care
Period

Thoracot
omy

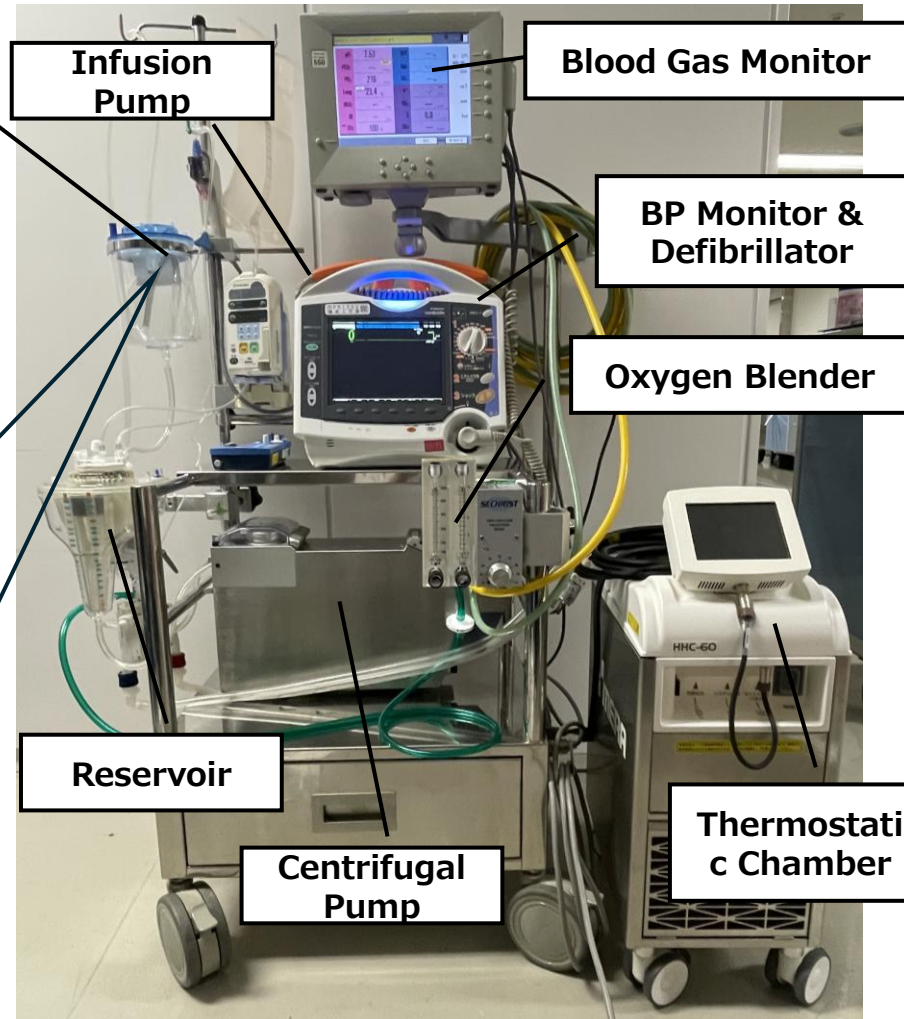
Heart
Expl.

Heart
Transplant

Next-Gen Simple Organ Perfusion Device Enables Real-Time Heart Function Monitoring

Organ Chamber

- Aortic Cannula
- LV Vent Cannula
- PA Vent Cannula



	Item
Aorta	Aortic Pressure
LV	LVP dP/dt (Contractility, Relaxation)
Echo	Ventricular Motion, Valve Function
Coronary Artery	Coronary Angiography