

# Heart transplantation of donor hearts after circulatory death using thoraco-abdominal normothermic regional perfusion with distant procurement and cold storage preservation during transportation: a presentation of two cases

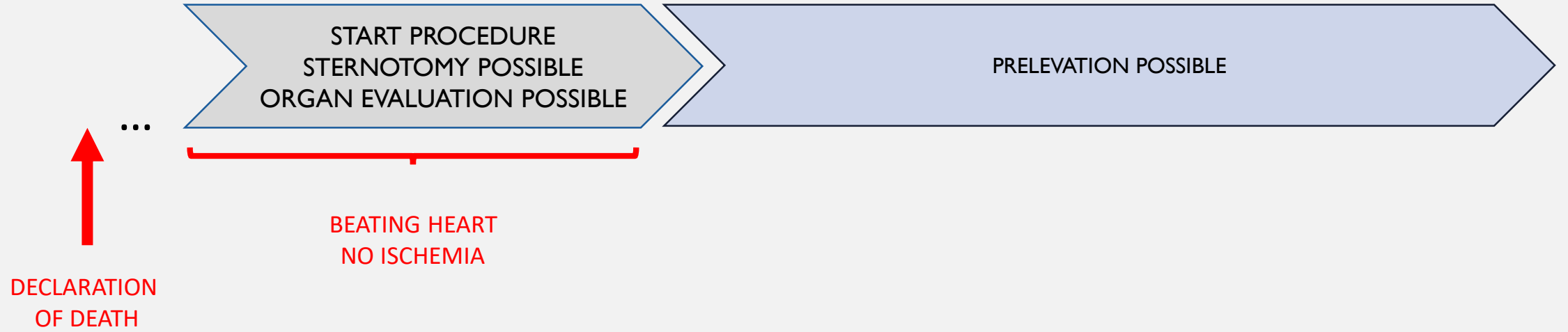
11 March 2020, BTS - SIZ Joint Meeting

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K. Degezelle<sup>1</sup>, J. Van Cleemput<sup>1</sup>, B. Meyns<sup>1</sup>, J.-O. Defraigne<sup>2</sup>, F. Rega<sup>1</sup>

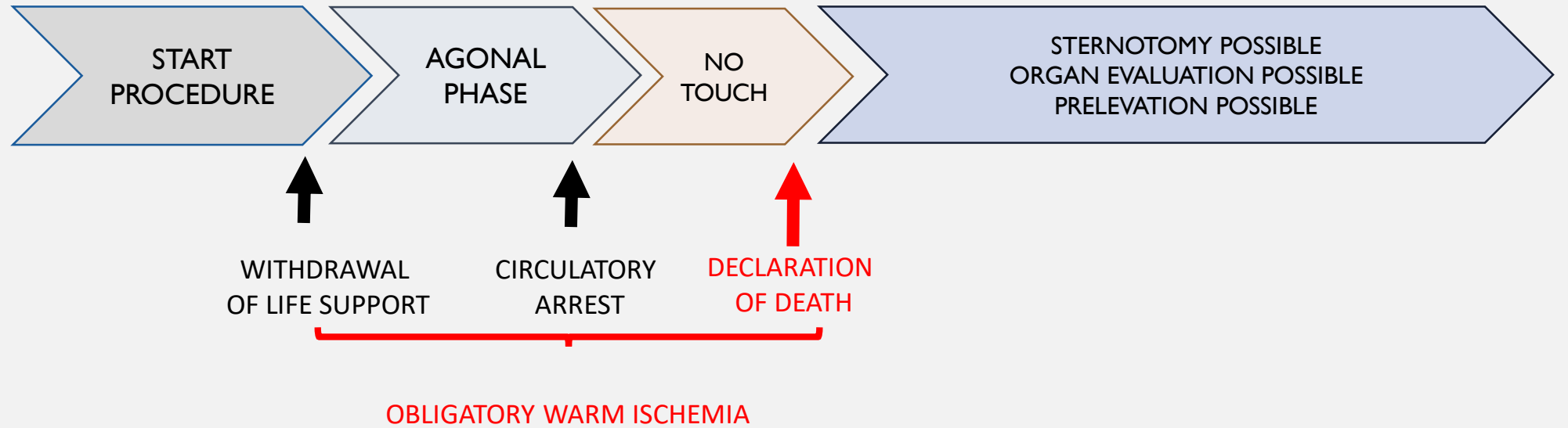
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# DBD (Donation After Brain Death)



# DCD III (Donation After Circulatory Death)



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# I. DCD - TA-NRP

## Thoraco-Abdominal Normothermic Regional Perfusion

- Organ preservation / resuscitation technique applied in a DCD setting
- Selective perfusion of potentially transplantable organs in a delineated area

# I. DCD - TA-NRP

## REGULAR DCD III PROCEDURE

Pre-WLST  
donor  
preparation

WLST

No  
touch

Declaration  
of death

Clamping  
cerebral  
vessels

Start  
NRP

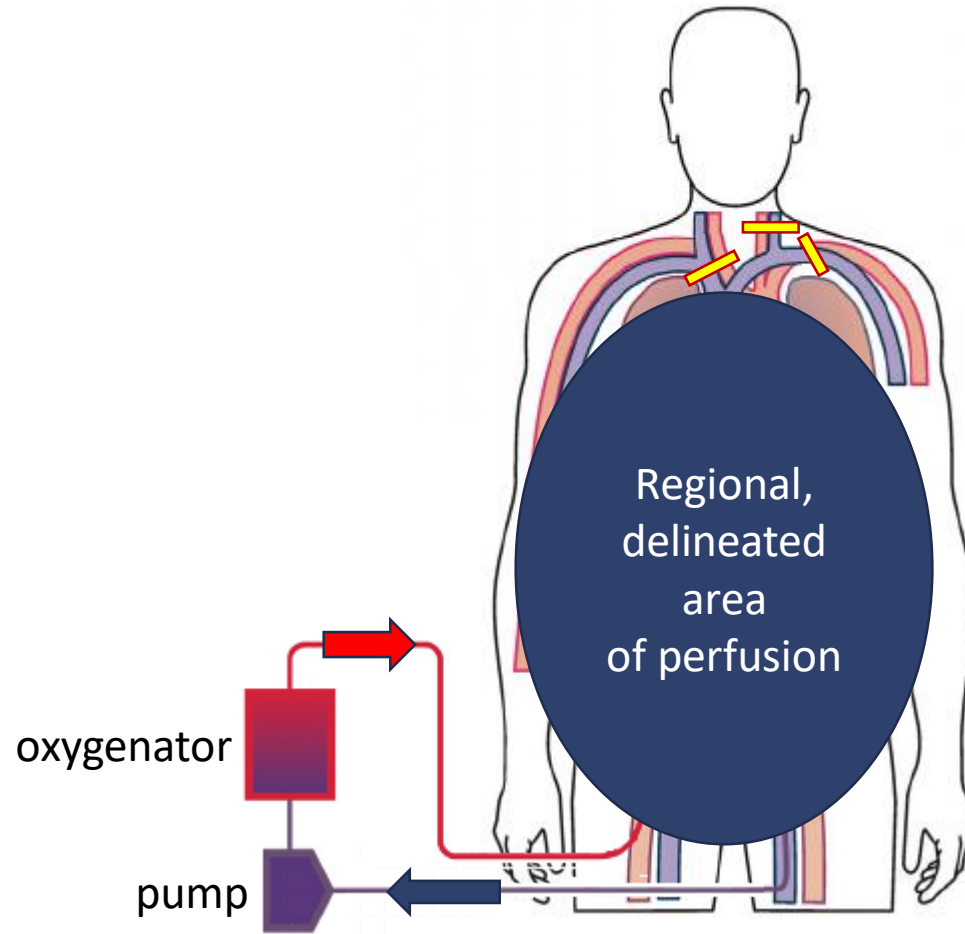
Beating  
heart

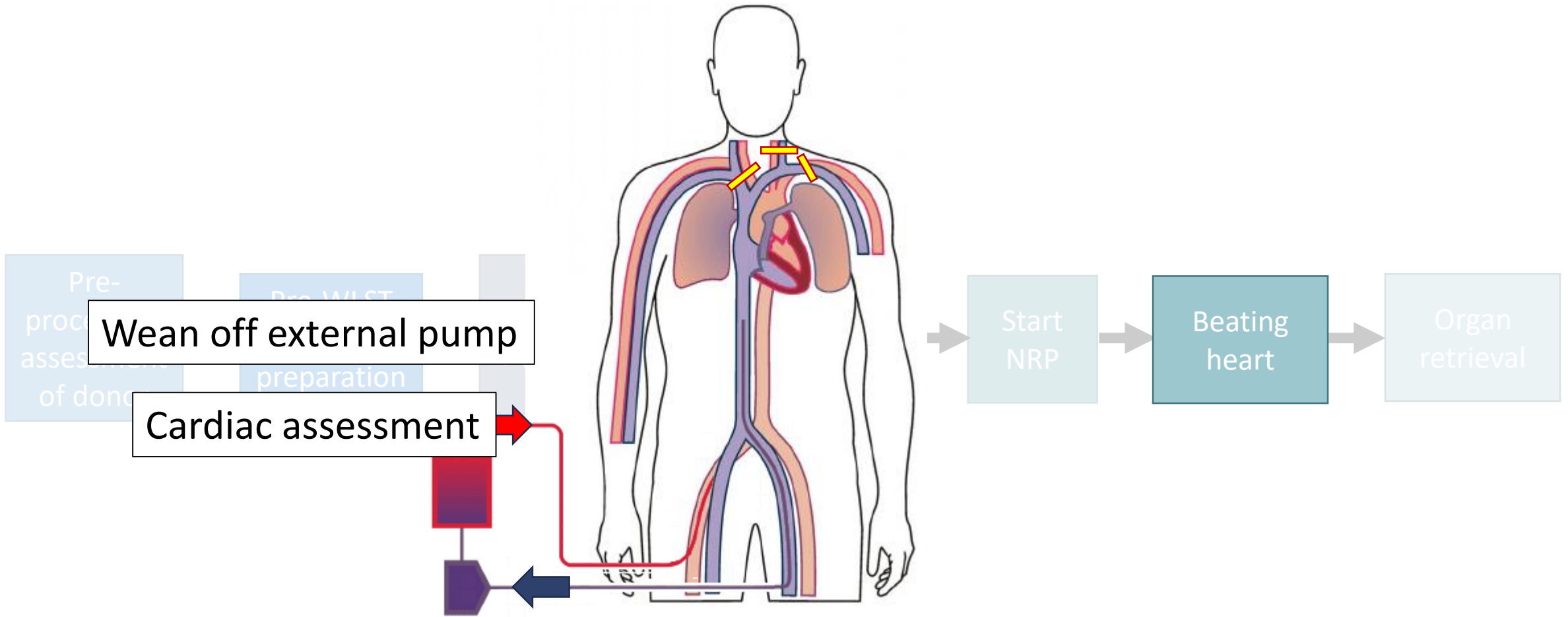
Organ  
retrieval

Direct Procurement and  
Preservation  
(DPP)

Thoraco-Abdominal  
Normothermic Regional  
Perfusion  
(TA-NRP)

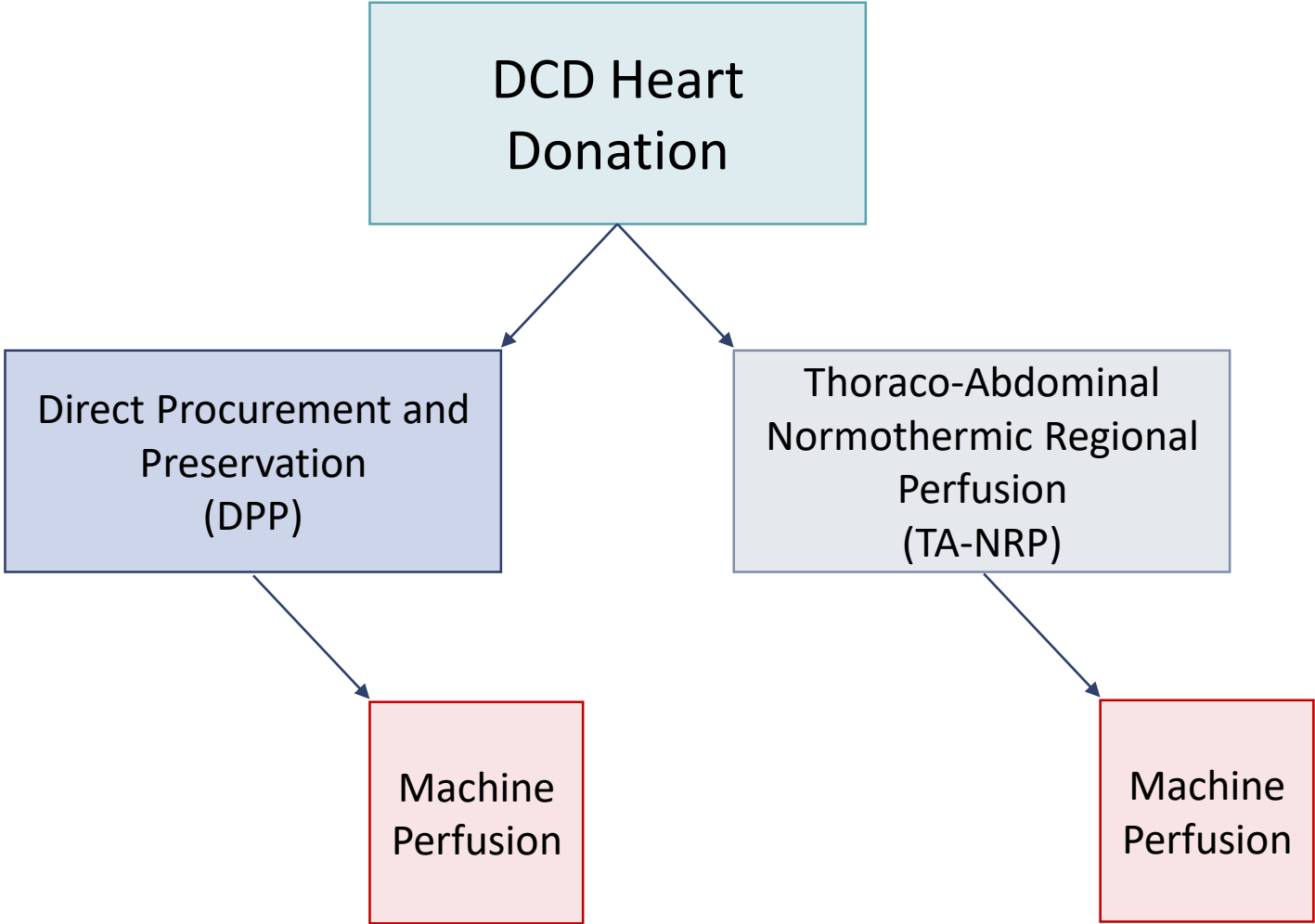
# I. DCD - TA-NRP

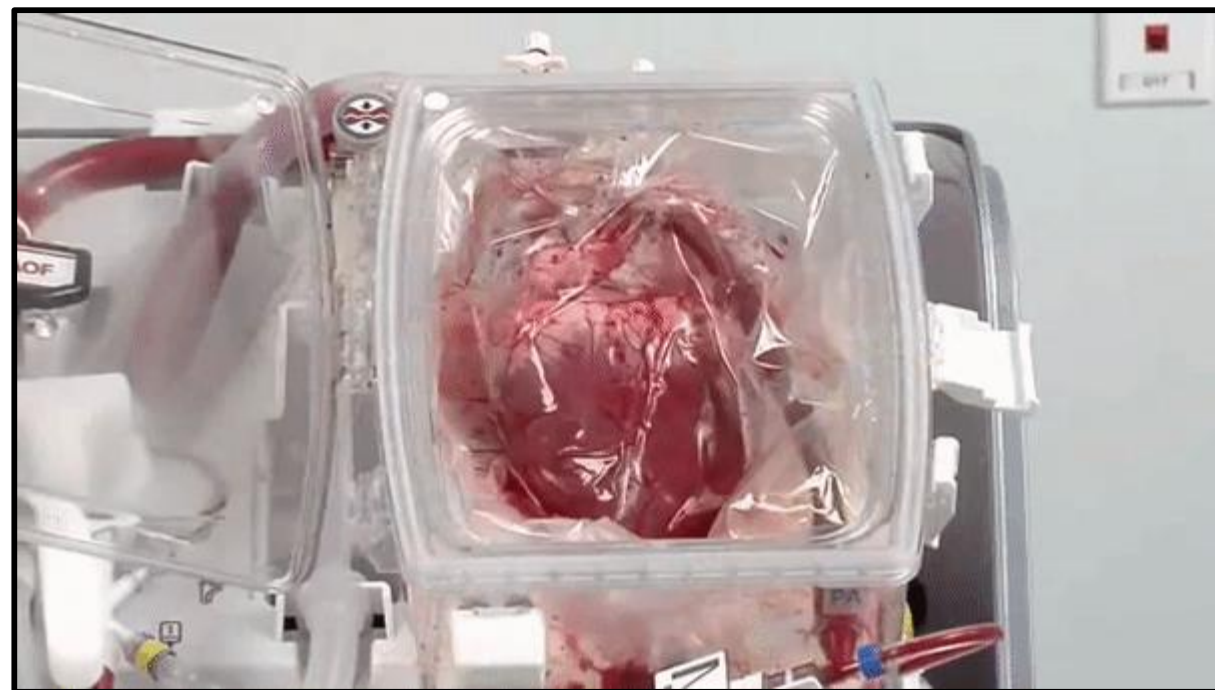
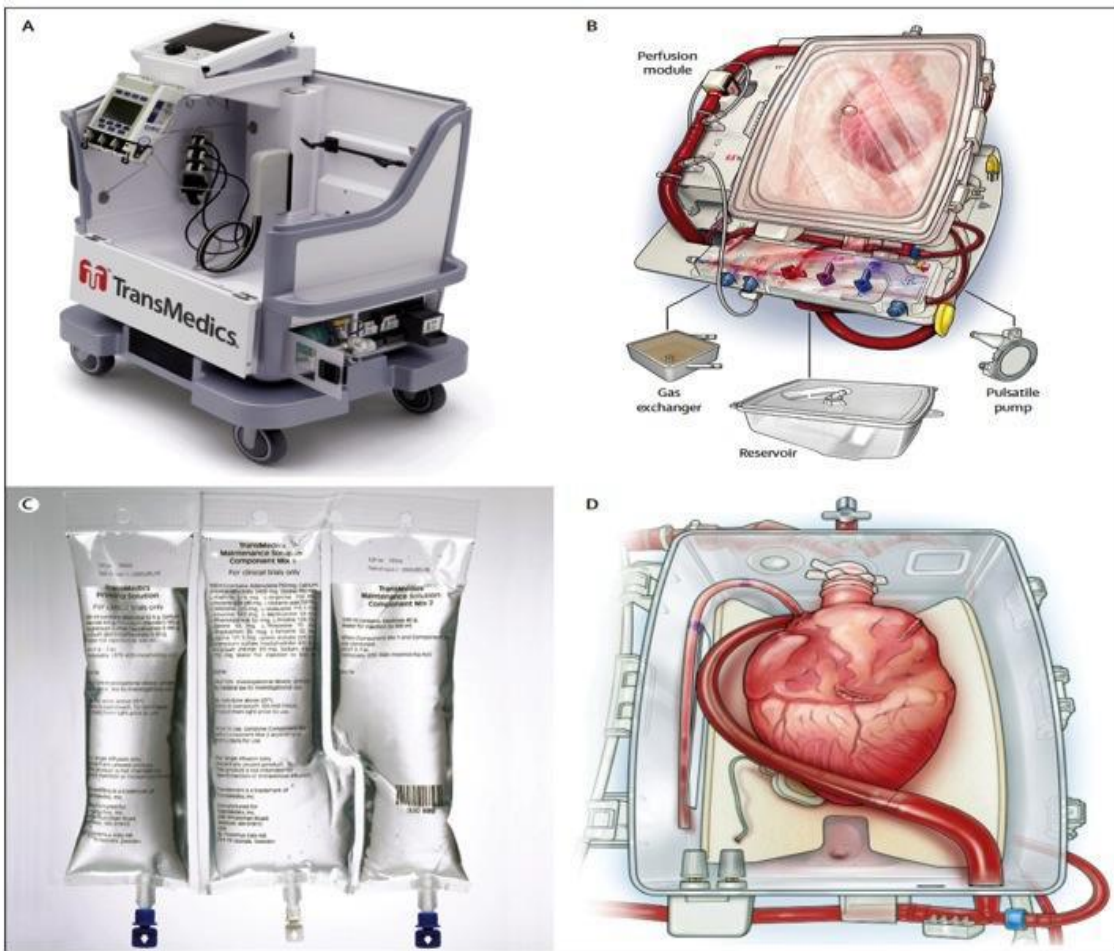


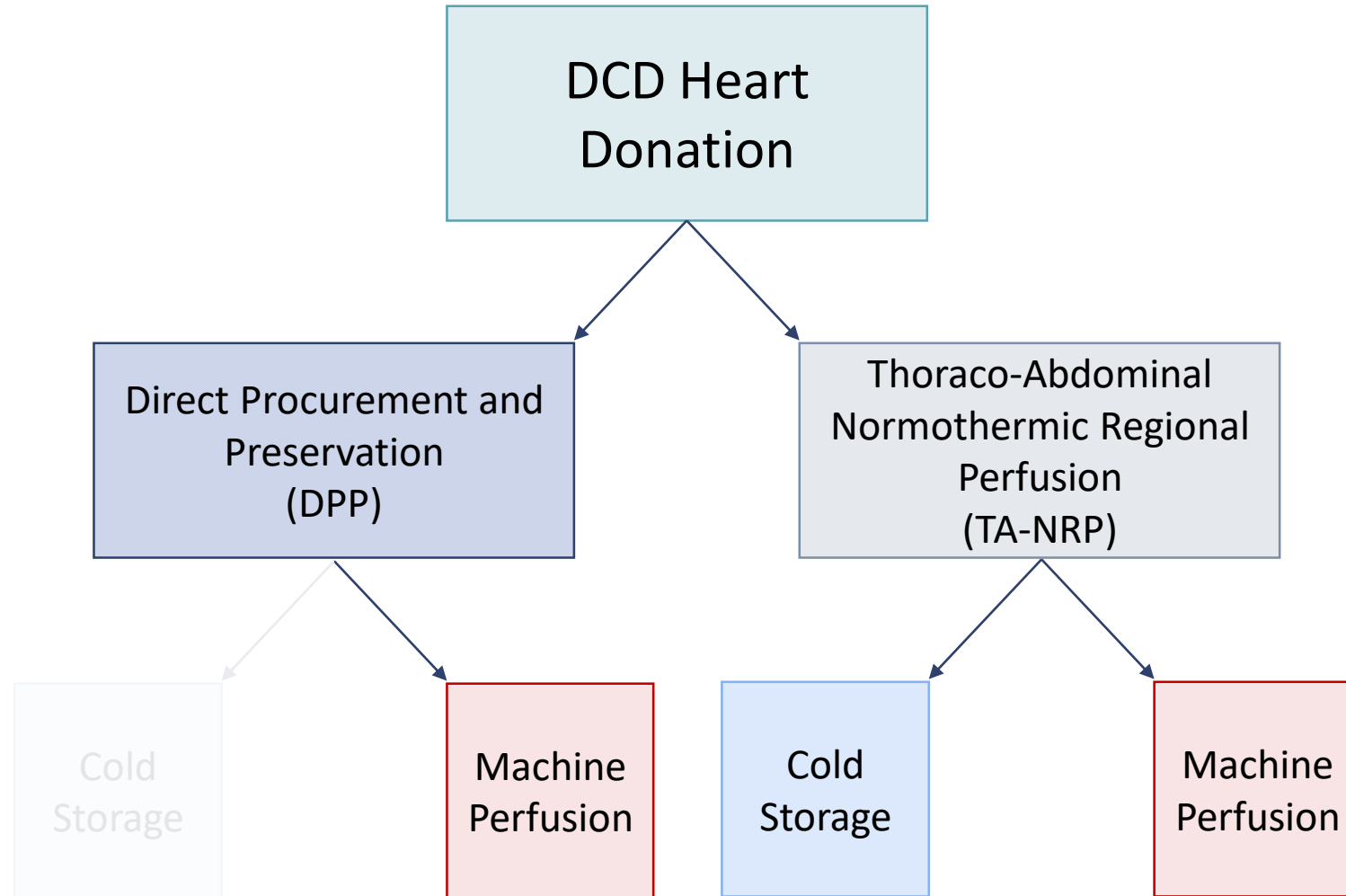




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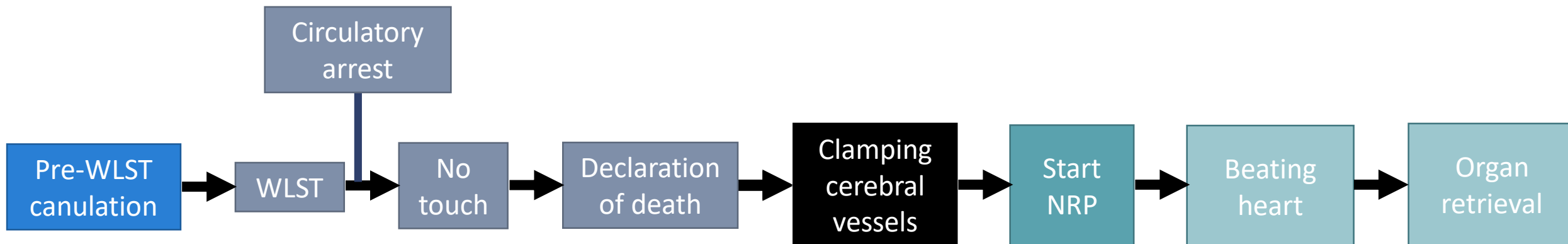


## 2. CASES: demographics donors

	Donor 1	Donor 2
<b>Age (years)</b>	12	54
<b>Sex</b>	Male	Female
<b>Blood group</b>	O positive	O positive
<b>Height (cm)</b>	162	164
<b>Weight (kg)</b>	42	60
<b>Diagnosis</b>	Hypoxic brain injury	Traumatic brain injury
<b>Norepinephrine before WLST (<math>\mu\text{g}/\text{kg}/\text{min}</math>)</b>	0	0.08
<b>Ejection fraction (%)</b>		
<b>Days in ICU</b>	13	11

## 2. CASES: timings

	Donor 1	Donor 2
WLST to circulatory arrest (min)	11	22
WLST to declaration of death (min)	16	27
Knife to skin to start reperfusion (min)	18	31
WLST to start TA-NRP (min)	2	4
Duration of external pump support (min)	16	5
Duration after weaning to procurement (min)	89	35
Total reperfusion (min)	105	41



## 2. CASES: demographics + timings recipients

	Recipient 1	Recipient 2
<b>Age (years)</b>	14	58
<b>Sex</b>	Male	Female
<b>Blood group</b>	O positive	O positive
<b>Height (cm)</b>	157	159
<b>Weight (kg)</b>	33	61
<b>Etiology of heart failure</b>	Idiopathic cardiomyopathy	Non-ischemic dilated cardiomyopathy
<b>Pre-transplant ejection fraction (%)</b>	/	25
<b>Pre-transplant LVAD</b>	Yes	No
<b>Cold static storage time until first retrograde cardioplegia</b>	129	98
<b>Time from first retrograde cardioplegia until release cross clamp recipient</b>	24	30
<b>Time from cross clamp donor until release cross clamp recipient</b>	153	128
<b>Implant duration</b>	33	38
<b>Total CPB duration</b>	90	78
<b>CPB duration after release cross clamp</b>	41	32

## 2. CASES: outcomes recipients

	Recipient 1	Recipient 2
<b>Hemodynamics and cardiac function 7 days post transplantation</b>		
Cardiac output (liters / min)	2.43	3.27
Cardiac index (liters / min / m <sup>2</sup> )	1.96	2.06
Left ventricle ejection fraction (%)	45	54
Heart rate (beats / min)	86	88
CVP (mmHg)	8	9
PCWP (mmHg)	11	16
<b>Most recent hemodynamics and cardiac function</b>		
Days post-transplant	358	62
Cardiac output (liters / min)	2.83	3.53
Cardiac index (liters / min / m <sup>2</sup> )	2.28	2.22
Left ventricle ejection fraction (%)	50	60
Heart rate (beats / min)	76	90
CVP (mmHg)	6	10
PCWP (mmHg)	11	16
Pacemaker implantation	N	Y



# Conclusion

DCD heart transplantation using TA-NRP and cold storage is an effective and safe way to expand the donor heart pool, while avoiding costs of expensive machine perfusion.

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