

***Lung transplantation following aNRP***

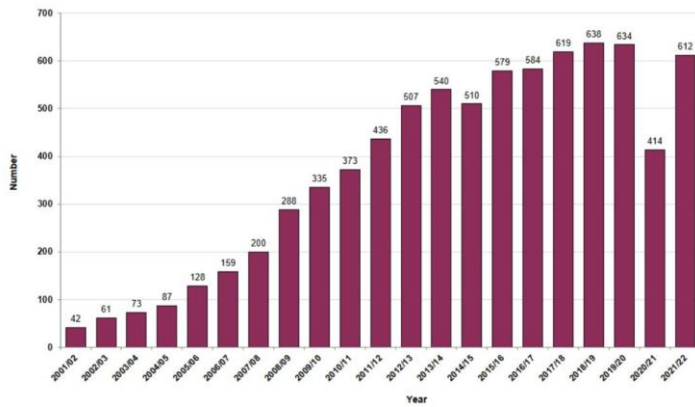
***Marius Berman, MD, FRCS (CTh)***

***Surgical Lead Transplantation and MCS - Royal Papworth Hospital***

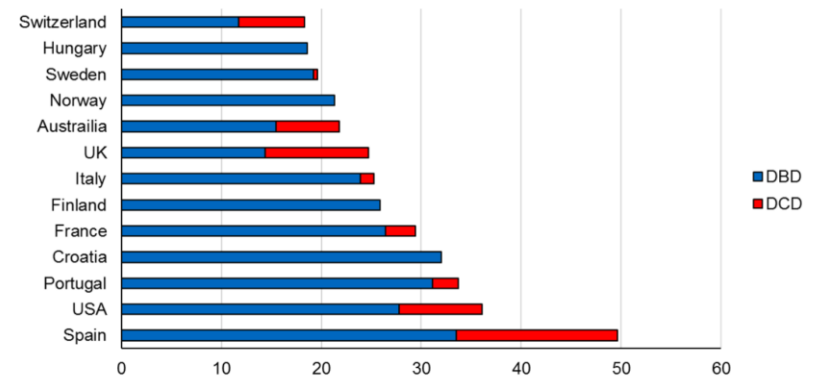
***Chair, Retrieval Advisory Group, NHSBT***

***Associate UK Clinical Lead Organ Retrieval - NHSBT***

DCD donors in the UK



Actual\* DBD and DCD organ donor rates for Europe, Australia and the USA, 2019



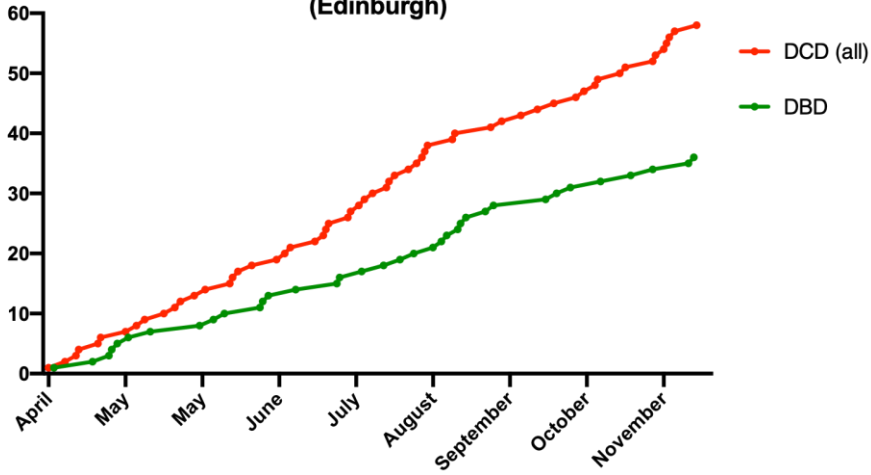
## DCD lung retrieval.....



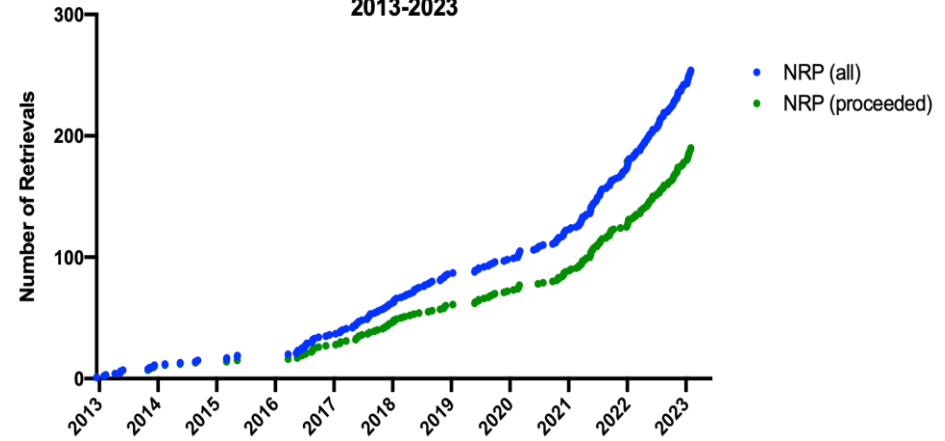
## CT NORS informed....with aNRP....!!!!!!



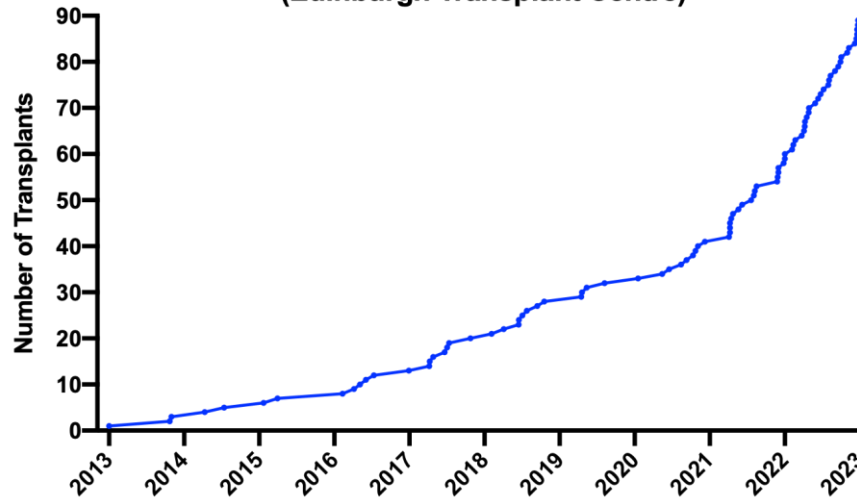
**DBD vs DBD retrieval 2022  
(Edinburgh)**



**Edinburgh NRP Activity  
2013-2023**



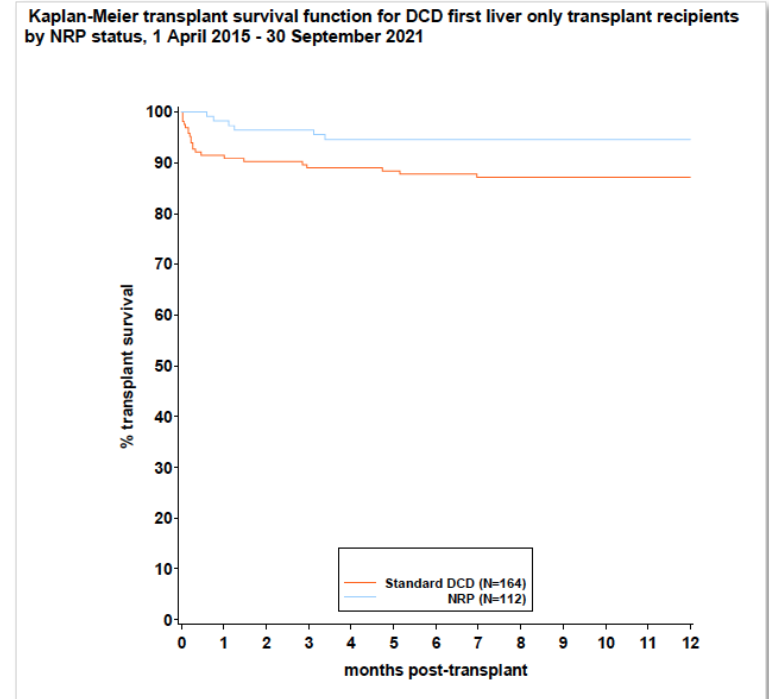
**DCD NRP Livers Transplanted  
(Edinburgh Transplant Centre)**



***Is aNRP any good?***

# A-NRP in the UK

- Improved liver utilisation
  - 70% A-NRP vs. 31% without A-NRP in 2022
- Superior liver outcomes
  - 94.6% ANRP vs 87.2% without NRP  
1-year transplant survival
- Superior kidney outcomes
  - 97.2% ANRP vs 93.9% 1-year graft survival

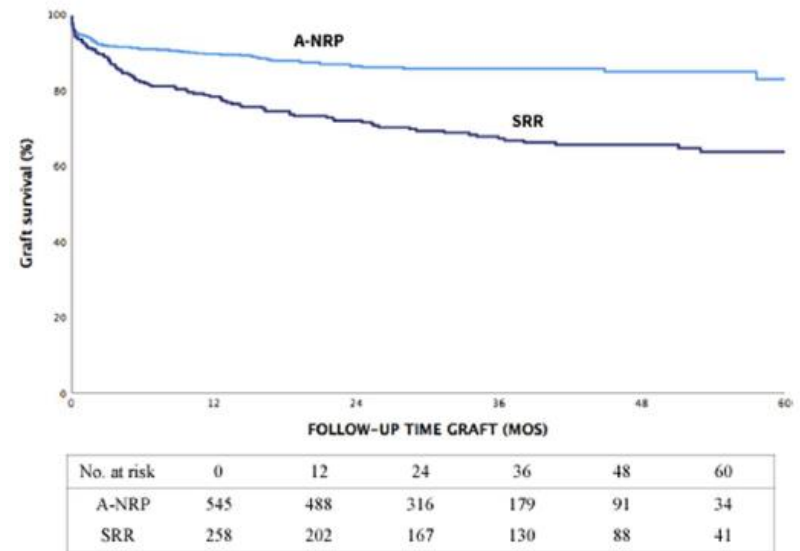
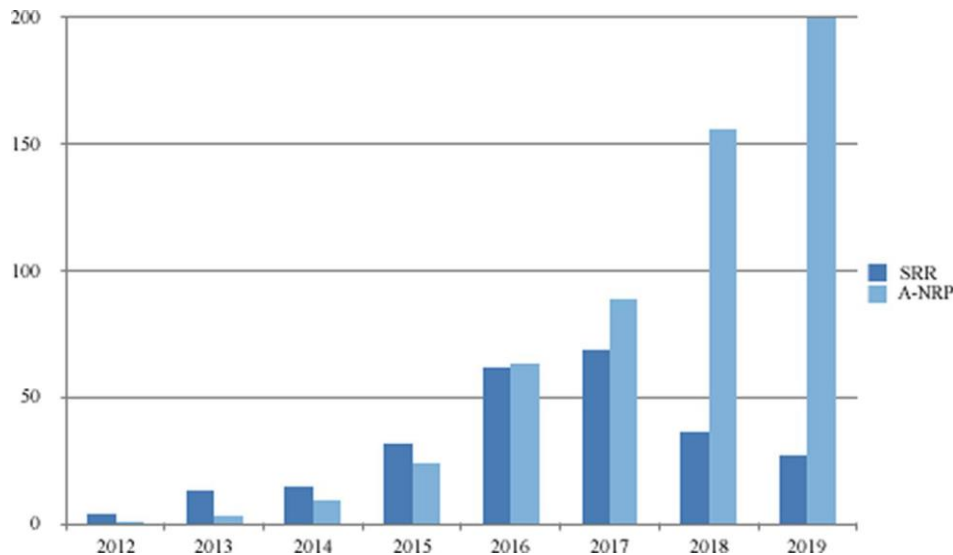


NHSBT quarterly report Jan 2023

*Courtesy C. Watson*

# NRP in Spain vs standard rapid retrieval

- Superior graft survival
- Minimal biliary complications
  - ITBL: 1% NRP vs 9% SRR



ITBL: Ischaemic type biliary lesions

*Courtesy C. Watson*

Am J Transplant 2022; 22: 1169

# NRP in France

- ALL!! DCD have mandatory aNRP
- ALL!! DCD lungs have mandatory EVLP  
(Xvivo –XPS, Transmedics OCS, “Home made”)
- > 80 DCD lungs +aNRP – survival >90%, no organ loss at retrieval!!(lungs or abdo.)



# Pre –op assessment

## Bronchoscopy

## Full body CT – anatomy, procedure planning.....

### Whole Body CT Imaging in Deceased Donor Screening for Malignancies

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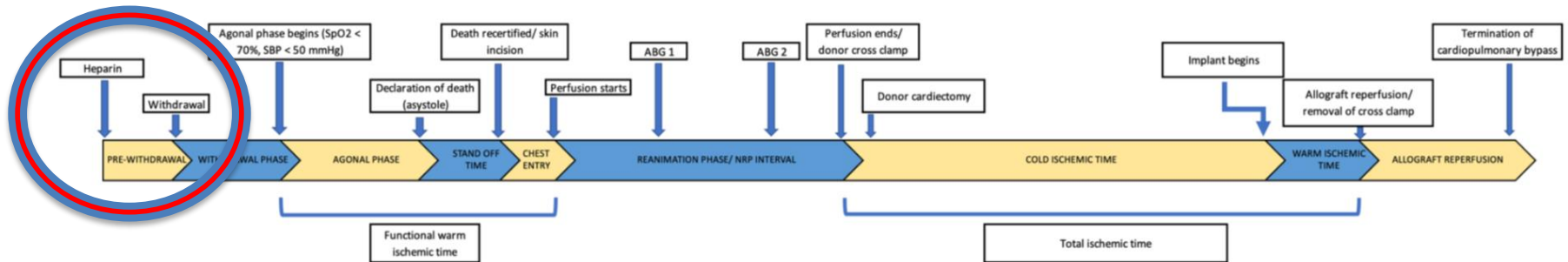
**Background.** In most western countries, the median donor age is increasing. The incidence of malignancies in older populations is increasing as well. To prevent donor-derived malignancies we evaluated radiologic donor screening in a retrospective donor cohort. **Methods.** This study analyzes the efficacy of a preoperative computed tomography (CT) scan on detecting malignancies. All deceased organ donors in the Netherlands between January 2013 and December 2017 were included. Donor reports were analyzed to identify malignancies detected before or during organ procurement. Findings between donor screening with or without CT-scan were compared. **Results.** Chest or abdominal CT-scans were performed in 17% and 18% of the 1644 reported donors respectively. Screening by chest CT-scan versus radiograph resulted in 1.5% and 0.0% detected thoracic malignancies respectively. During procurement no thoracic malignancies were found in patients screened by chest CT compared with 0.2% malignancies in the radiograph group. Screening by abdominal CT-scan resulted in 0.0% malignancies, compared with 0.2% in the abdominal ultrasound group. During procurement 1.0% and 1.3% malignancies were found in the abdominal CT-scan and ultrasound groups, respectively. **Conclusions.** Screening by CT-scan decreased the perioperative detection of tumors by 30%. A preoperative CT-scan may be helpful by providing additional information on (aberrant) anatomy to the procuring or transplanting surgeon. In conclusion, donor screening by CT-scan could decrease the risk of donor-derived malignancies and prevents unnecessary procurements per year in the Netherlands.

# **Pre- withdraw interventions**

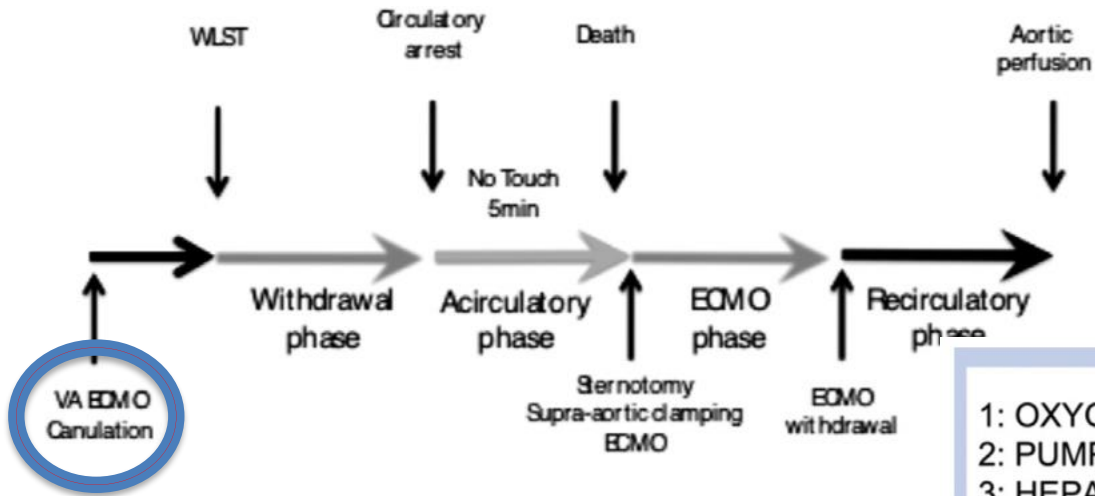
# Early US experience with cardiac donation after circulatory death (DCD) using normothermic regional perfusion

Jordan R.H. Hoffman et al. JHLT 2021

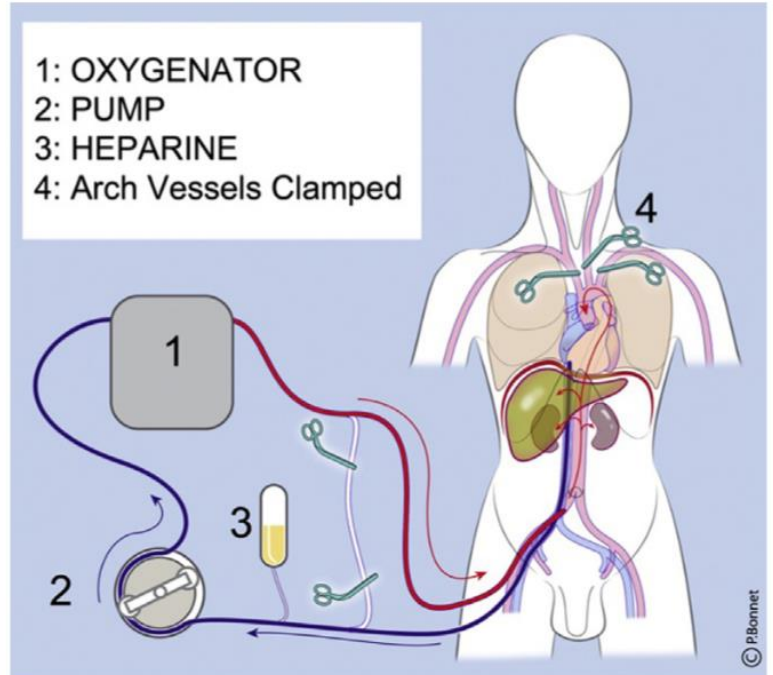
- 15 recipients, all DCD TANRP + cold storage.
- All alive at 30d.



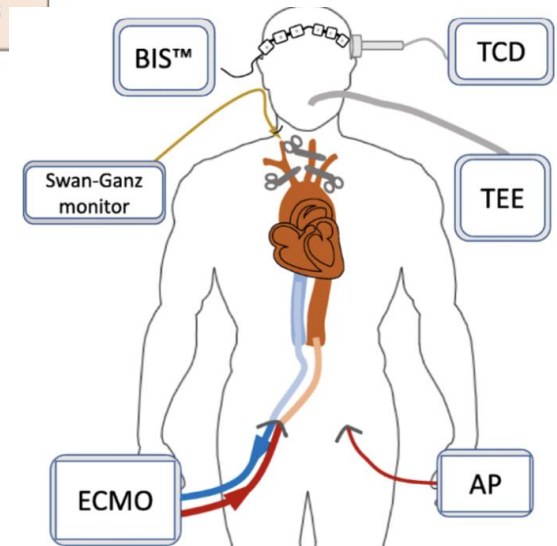
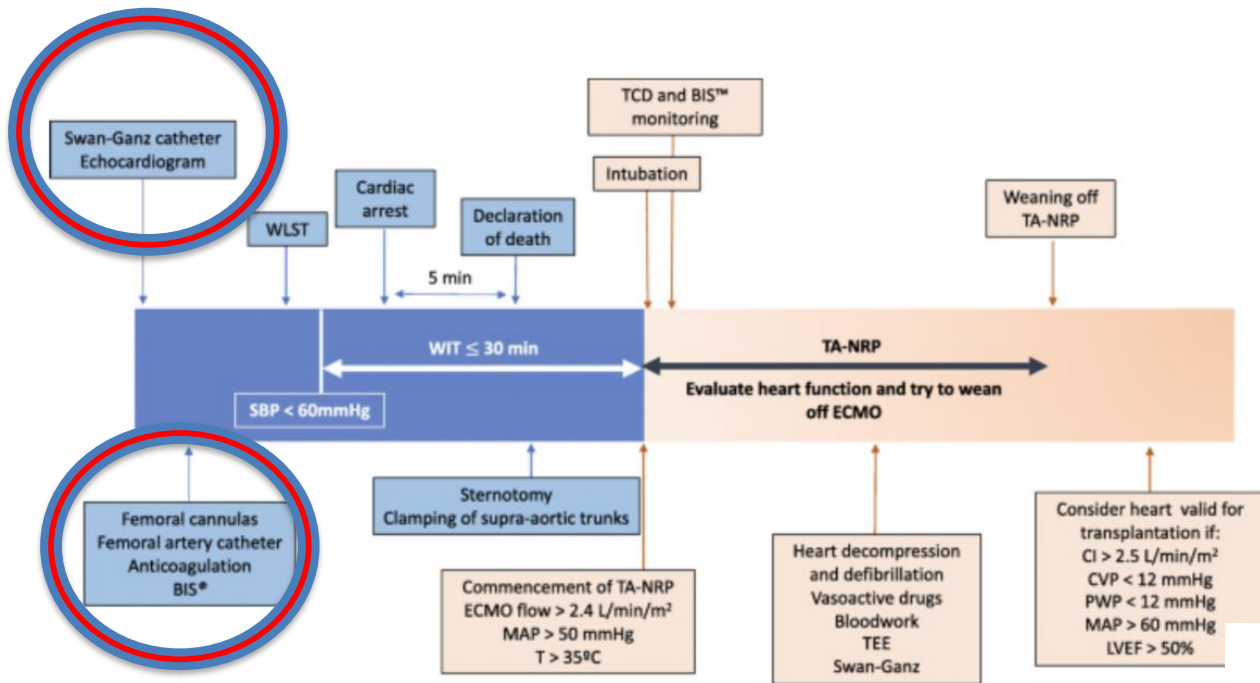
# Belgium



- 1: OXYGENATOR
- 2: PUMP
- 3: HEPARINE
- 4: Arch Vessels Clamped



# Transplantation of a heart donated after circulatory death via thoraco- abdominal normothermic regional perfusion and results from the first Spanish case November 2020



> 10 cases to date

# Peri retrieval UK setup

	Europe + N. America	UK
pre withdraw(PW) FOB	Yes	
PW CT	Yes	
PW Heparin	Yes	
PW Femoral vessel guidewires	Yes	
PW Femoral vessels NRP cannulation	Yes	
Team remuneration per utilization vs. attendance only	Yes	
Experience/consultant surgeons remuneration	Yes	
Institutional EVLP	Yes	
Regional ARC	Yes	

# **Outcomes of lungs activity with aNRP**

# PGD at 72 hours

- NO difference in rates Grade 3 PGD within/at 72 h between STD DCD vs aNRP DCD

For Grade 3 PGD at 72 hours:

G3 PGD	ANRP DCD	Std DCD	TANRP DCD
No	10	264	1
Yes	3	59	1

Chi-squared = 0.0054451, df = 1, p-value = 0.9412 (NB calculation excludes TA-NRP)

For Grade 3 PGD at any point within 72 hours:

G3 PGD	ANRP DCD	Std DCD	TANRP DCD
No	9	238	1
Yes	4	85	1

Chi-squared = 0.0013141, df = 1, p-value = 0.9711 (NB calculation excludes TA-NRP)



aNRP.

Med age 51y (23-58)

standard retrieval

Med. Age 47 (31-56)

**Table 1 90 day adult lung survival rates, by retrieval method, 1 April 2011 – 31 December 2022**

Method	Number of transplants	<u>90 day</u> patient survival rate (95% CI)	<u>90 day</u> graft survival rate (95% CI)
Standard DCD	329	85.4 (81.1-88.8)	86.0 (81.8-89.3)
A-NRP	15	93.3 (61.3-99.0)	93.3 (61.3-99.0)
Log-rank p-value		0.3936	0.4207
Overall	344	85.7 (81.6-89.0)	86.3 (82.2-89.5)

3 TANRP – all alive!

Figure 1 90 day adult lung patient survival by retrieval method, 1 April 2011 – 31 December 2022

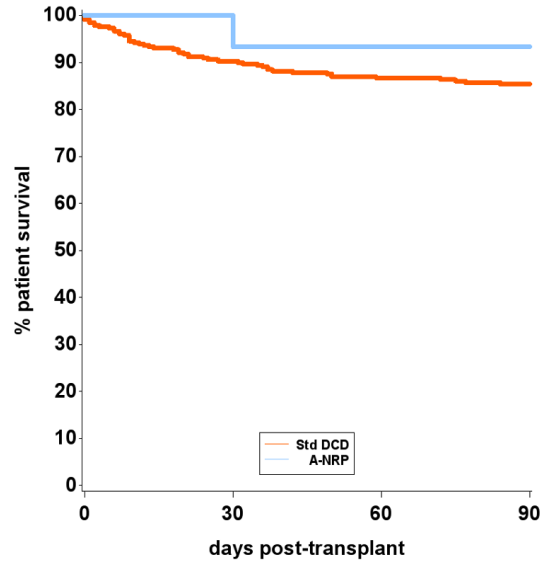
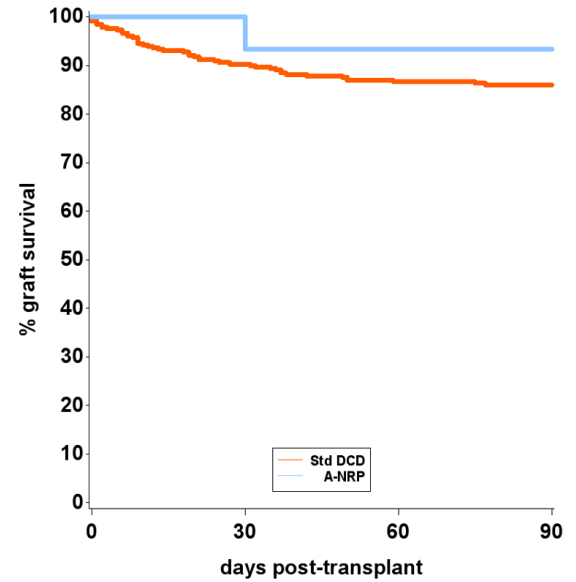


Figure 2 90 day adult lung graft survival by retrieval method, 1 April 2011 – 31 December 2022



Courtesy of R. Hogg

# So,

- aNRP is here to stay
- UK DCD lung utilization is all time low
- DCD lung retrieval can be done safely with aNRP (French experience)
- UK DCD lung retrieval with aNRP – work in progress....
- PGD 72h DCD lungs aNRP = DCD lungs std.
- Survival DCD lungs aNRP = DCD lungs std.

# Current challenges at retrieval

- Minimum/no pre-op information
- No pre-op interventions
- Lung retrieval + aNRP - large variation in expertise and outcomes between teams
- TANRP stopped

# Future

- Cadaveric Training (28/3, 11/23, NORs masterclass)
- Addressing the TANRP ethical question ASAP
- Update Organ Donation Framework
- Funding of experienced organ retrieval teams?
- Reduce number of specialized retrieval teams for aNRP + Lungs?
- Direct remuneration for surgeons – per activity?