

# 3° CONGRESO ARGENTINO DE NEONATOLOGIA

EL NEONATO COMO DONANTE DE ÓRGANOS  
REALIDAD DEL TRASPLANTE CARDÍACO

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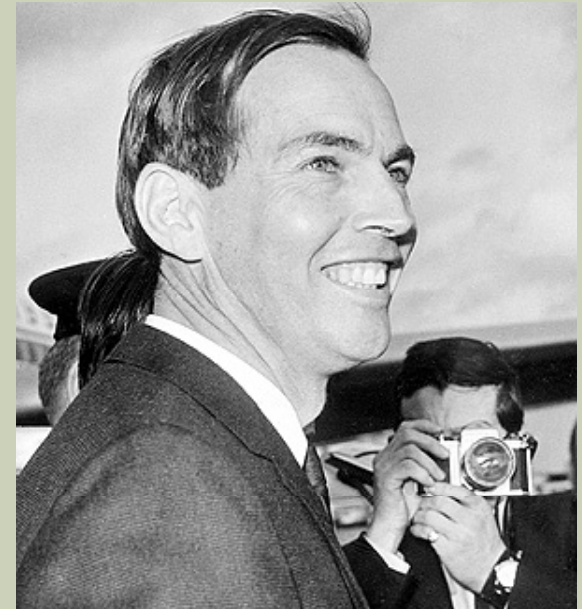
2016

# TRASPLANTE CARDÍACO NEONATAL HISTORIA

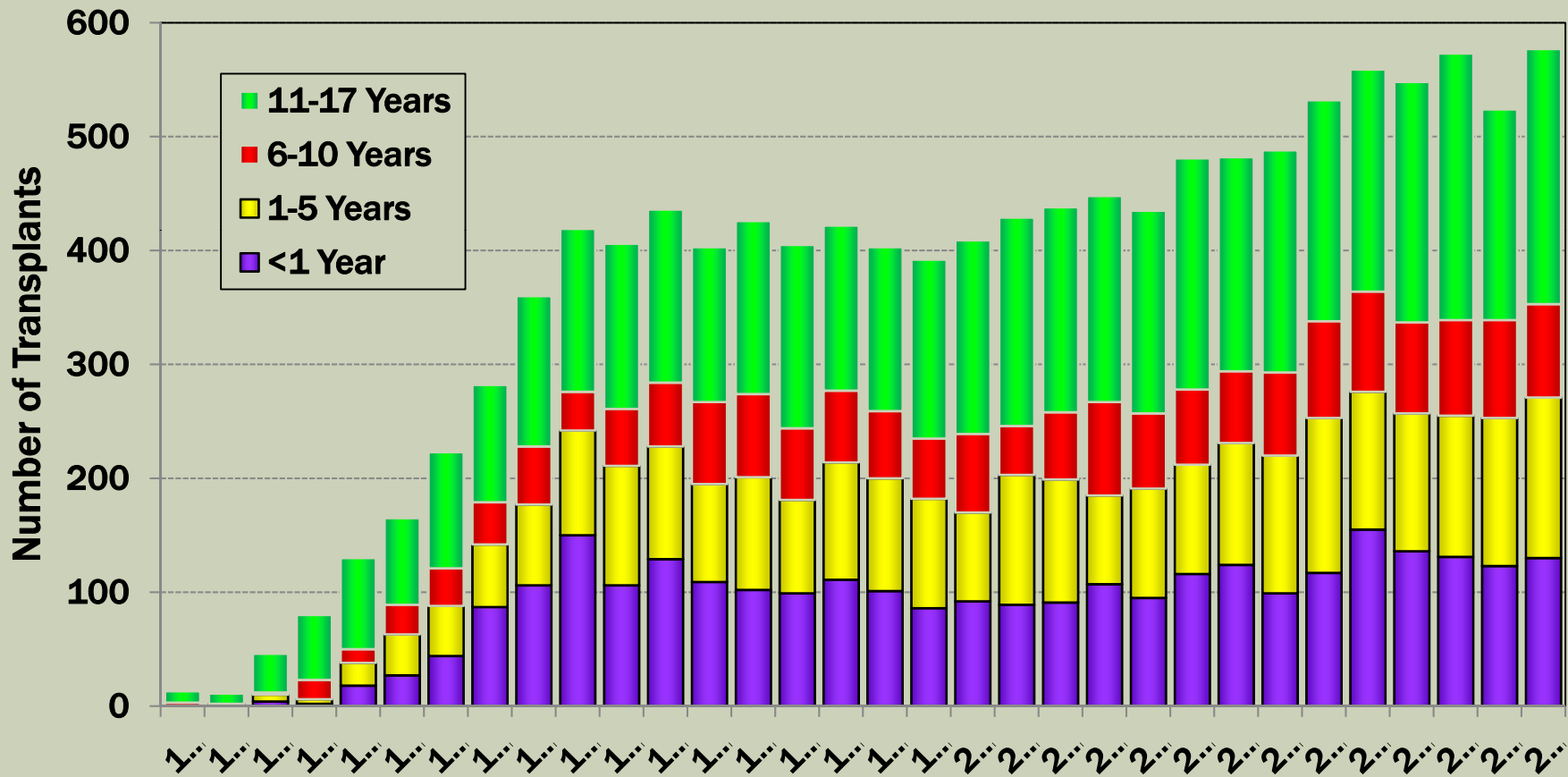
1967 CHRISTIAN BARNARD  
ADRIAN KAMTROWICZ

1984 MAGDY YACoub  
LEONARD BAILEY (XENOTX)

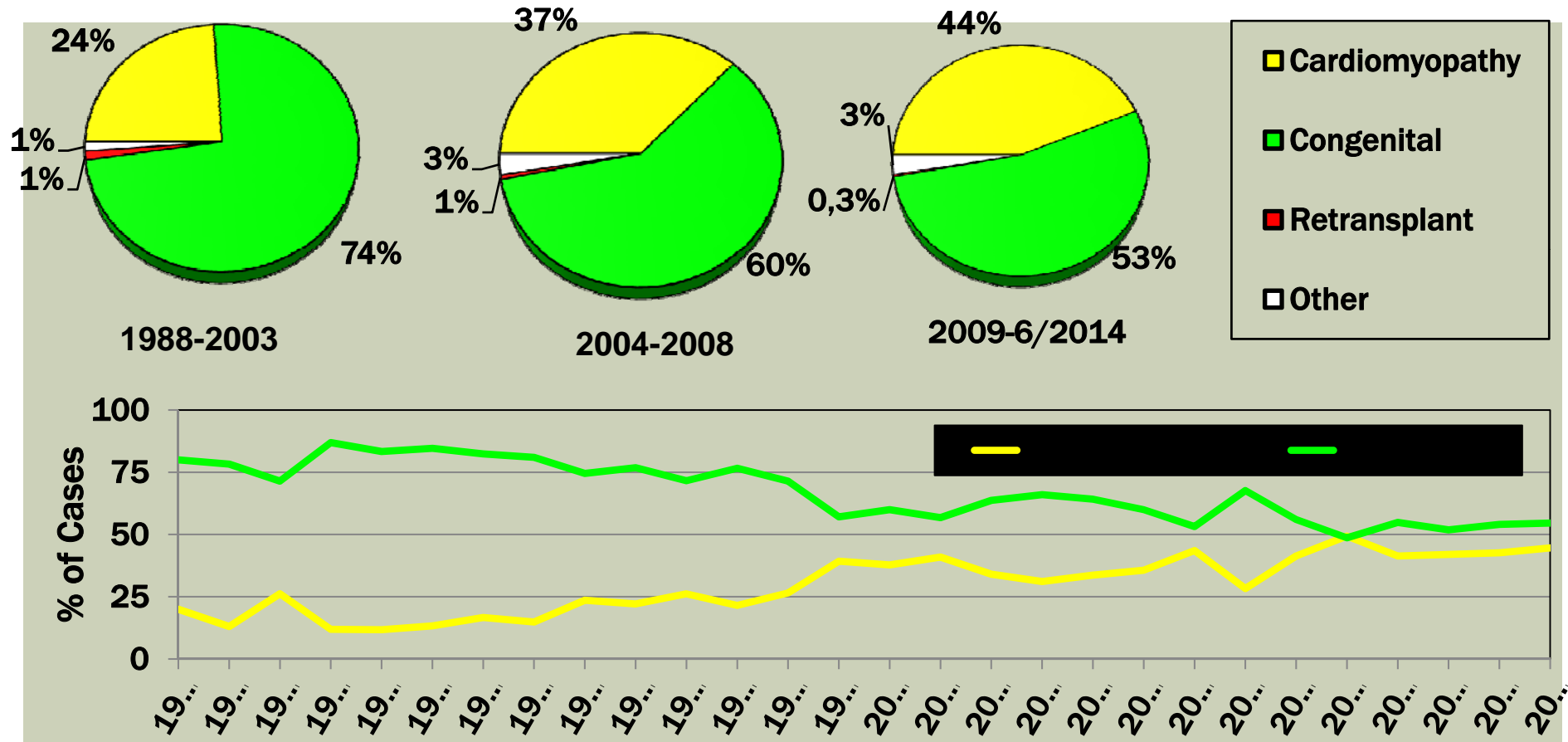
1985 DENTON COOLEY  
PRIMER TRASPLANTE EXITOSO



# PEDIATRIC HEART TRANSPLANTS RECIPIENT AGE DISTRIBUTION BY YEAR OF TRANSPLANT



# PEDIATRIC HEART TRANSPLANTS RECIPIENT DIAGNOSIS (AGE: < 1 YEAR)



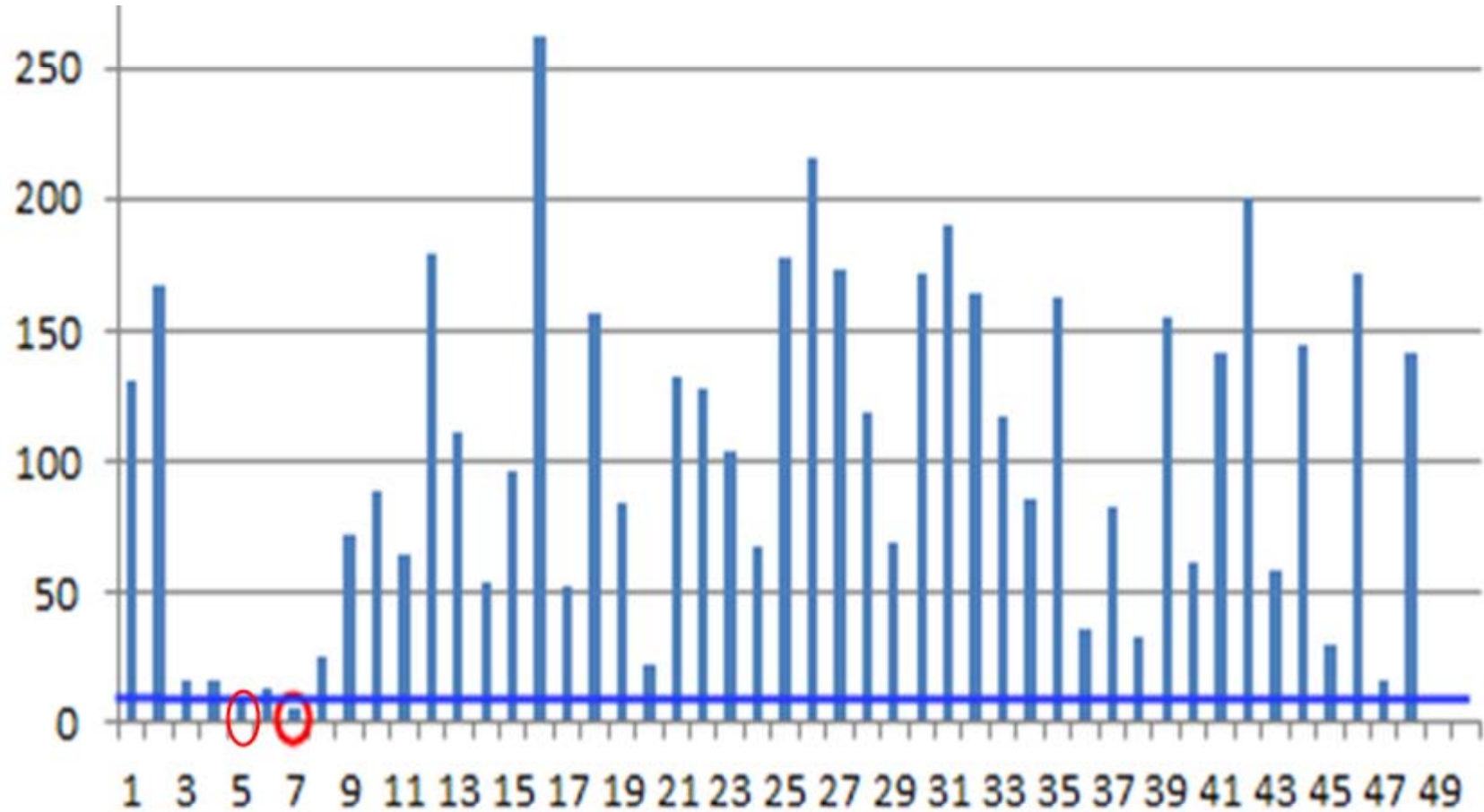
## Pacientes menores de 18 años trasplantados 2005-2015

Órgano	n
Riñón	771
Higado	525
Corazón	87
Intestino	26
Pulmón	22
Higado+ intestino/ riñón	12
Block cardiopulmonar	4
Riñon + pánreas	1
Higado+pánreas+intestino	1
Pácreas	1
CPH (2009-2014)	659
<b>Total</b>	<b>2109</b>

Fuente INCUCAI

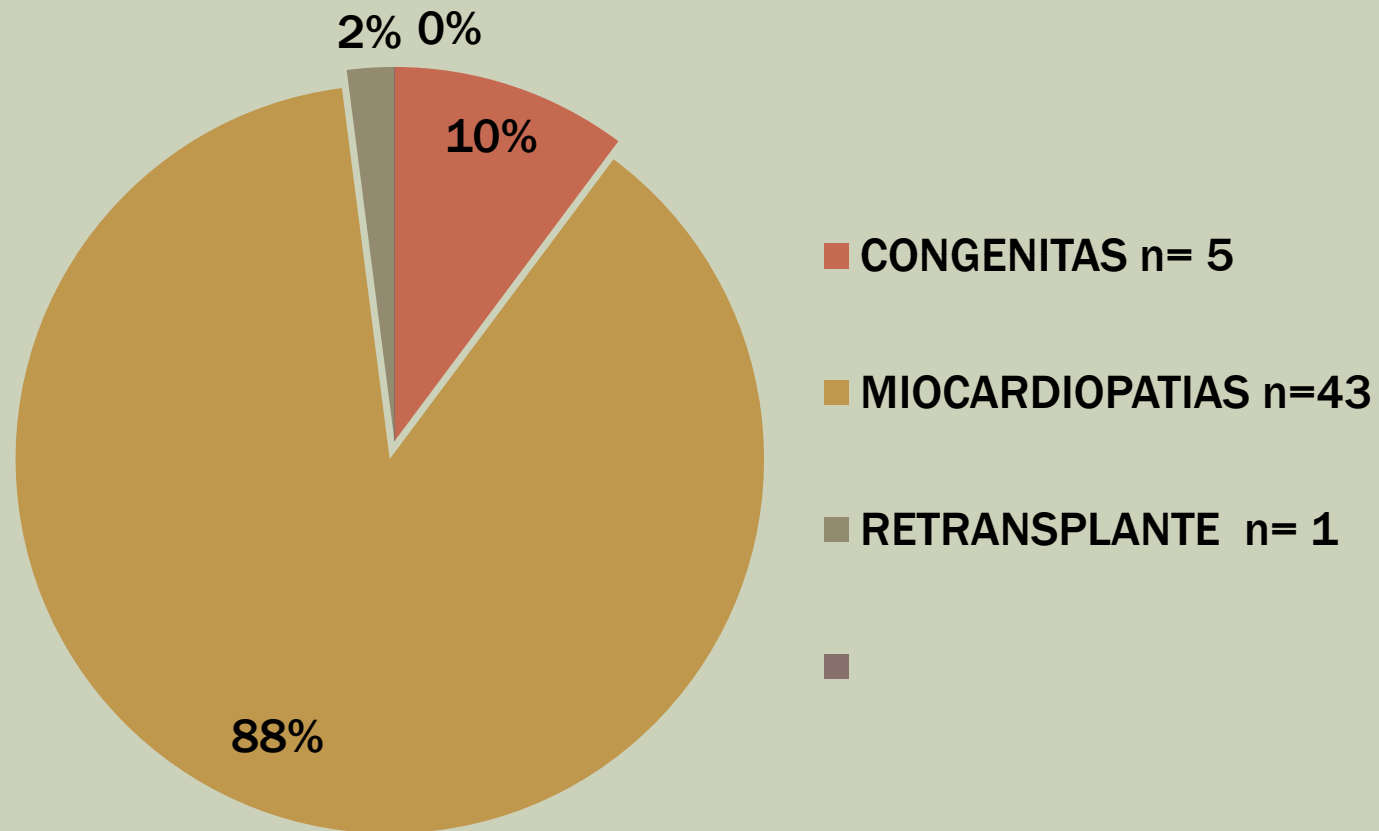
# TRASPLANTE CARDÍACO PEDIÁTRICO

## EDAD EN MESES AL TRASPLANTE



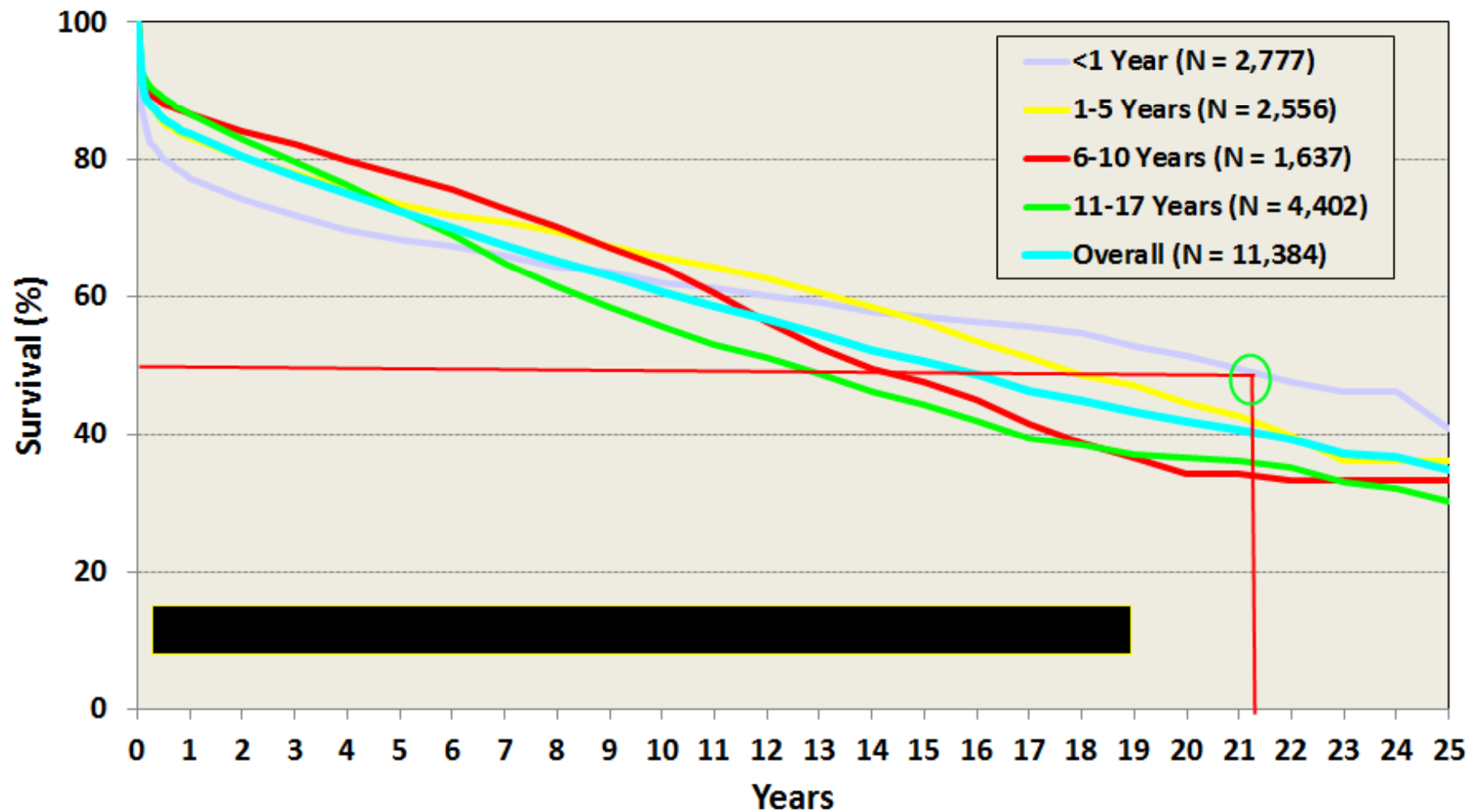
# TRASPLANTE CARDÍACO PEDIÁTRICO

## DIAGNÓSTICOS DE RECEPTORES



# PEDIATRIC HEART TRANSPLANTS

## KAPLAN-MEIER SURVIVAL (TRANSPLANTS: JANUARY 1982 - JUNE 2013)





# TRASPLANTE CARDÍACO CAUSAS DE MUERTE

## Antes del año

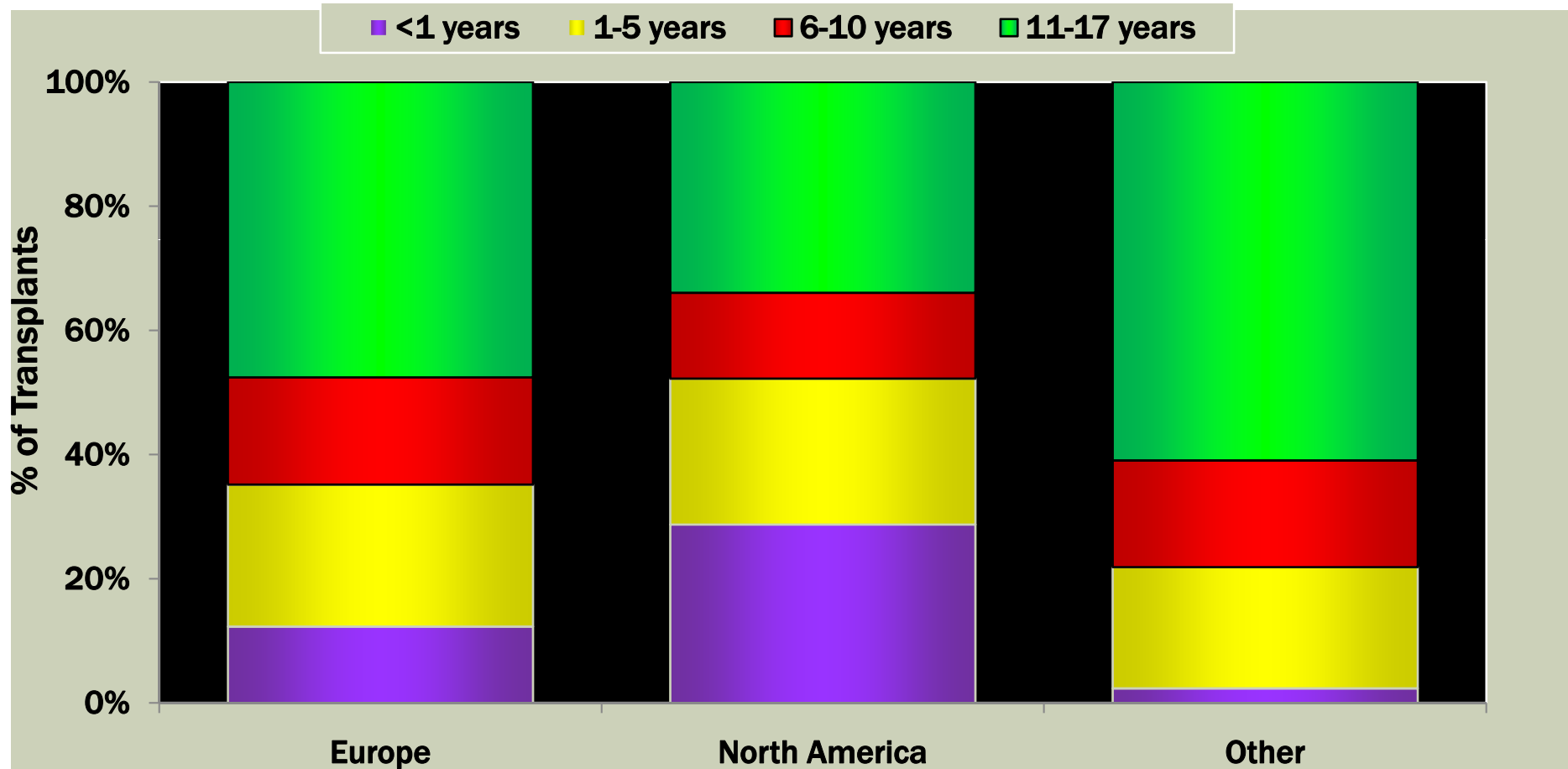
- Fallo del injerto 28%
- Fallo multiorgánico 16%
- Rechazo agudo 12%
- ACV 9,1%
- Infección 8,5%
- Otras

## Después de 10 años

- Fallo del injerto 34%
- Vasculopatía cor. 25%
- Fallo multiorgánico 6,6%
- Infección 5,8%
- Otras



# PEDIATRIC HEART TRANSPLANTS RECIPIENT AGE DISTRIBUTION BY LOCATION (TRANSPLANTS: JANUARY 2004 – JUNE 2014)



# TRASPLANTE CARDÍACO

*Arch Dis Child Fetal Neonatal Ed* doi:10.1136/adc.2010.192757

## Editorial

ADC-FNN Online First, published on October 30, 2010 as 10.1136/adc.2010.192757

Editorial

## Neonatal organ donation: has the time come?

Joe Brierley

Organ transplantation provides life-saving treatment for children with severe end-organ failure, using organs usually sourced from live-related or cadaveric donors.

Infants under 2 months in the UK do not donate organs, whereas in other, similarly developed, healthcare systems, such donation and transplantation are routine. Indeed, infant hearts donated in

death (BSD) certifiable by bedside brainstem tests.<sup>3</sup> BSD is usually a result of traumatic or hypoxic brain injury, causing sustained raised intracranial pressure, leading to cerebellar tonsil herniation through the foramen magnum, thereby irreversibly compressing the medulla—a process referred to as coning.

BSD actually developed to predict somatic death, with no connection to

### What is known

- ▶ In many other countries, term babies with catastrophic brain injury can, in the same way as children and adults, be certified as having died using neurological criteria.
- ▶ Organ donation and transplantation in the neonatal and early infancy period are technically possible and occur in other countries, but not in the UK, as current clinical guidelines do not support this.

### What this paper adds

# DONANTES 0-1 AÑO 2010-2016

<b>Glasgow denunciados</b>	<b>398</b>
<b>Evolución a ME</b>	<b>158</b>
<b>Donantes reales</b>	<b>18</b>

<b>Causa de muerte</b>	<b>%</b>
<b>Anoxia</b>	<b>31</b>
<b>Otras causas</b>	<b>27</b>
<b>Inf. SNC</b>	<b>19</b>
<b>Trauma &amp; accidentes</b>	<b>14</b>

Fuente INCUCAI

# RECEPTORES 0-1 AÑO 2010-2016

ÓRGANO	n
HÍGADO	19
RIÑÓN	15
INTESTINO	11
CORAZÓN	3

# CONDICIONES PARA EL TRASPLANTE CARDÍACO

- Edad gestacional >36 semanas
- Peso mayor de 2,500 g.
- No infección VIH-VHB
- Soporte familiar
- Ausencia síndrome genético mayor

# TRASPLANTE CARDÍACO

## INDICACIONES EN NEONATOS

### **A. CRITERIOS DE INCLUSIÓN**

- MIOCARDIOPATÍAS
- HIPOPLASIA DEL VI. Dependencia ARM, disfunción ventricular, insuficiencia valvular sistémica,
- MALFORMACIONES CARDIACAS COMPLEJAS NO RESPONDEDORAS A CIRUGIAS CORRECTORA O PALIATIVA.
- INSUFICIENCIA CARDIACA PROGRESIVA
- TUMOR
- SME SHONE- EBSTEIN
- CANAL DISBALANCEADO
- MIOCARDITIS

### **B . CRITERIOS DE EXCLUSIÓN**

- AUSENCIA O HIPOPLASIA DE AP
- AUSENCIA O HIPOPLASIA VP
- SEVERO E IRREVERSIBLE DETERIORO FUNCIONAL DE OTROS ORGANOS O SISTEMAS, MULTISISTÉMICO
- SMES GENETICOS ASOCIADOS (15-20% : KABUKI, NOONAN, CHARGE, HOLT ORAN, OPITZ, TRISOMIAS 13,18, 21)

# TRASPLANTE CARDÍACO

## INCIDENCIA HIPOPLASIA VENTRÍCULO IZQUIERDO (HLHS)

- 1.8-3.8 % DE LAS MALFORMACIONES CONGÉNITAS
- INCIDENCIA 0,0165 -0,036% DE NIÑOS NACIDOS VIVOS
- CAUSA DEL 23% DE FALLECIDOS POR CARDIOPATÍAS EN LA PRIMER SEMANA Y 15 % DENTRO DEL PRIMER MES DE VIDA.

MOSS Y ADAMS. HEART DISEASE IN INFANTS  
CHILDREN AND ADOLESCENTS.2013

EN ARGENTINA, SOBRE 700000  
NACIMIENTOS ANUALES = +/-120 RN CON HLHS



# CARDIOPATÍAS CONGÉNITAS OPERADAS HTAL. GARRAHAN 2015

<b>Total cirugías</b>	<b>580</b>
<b>Total de Hipolasias VI</b>	<b>20</b>
<b>Operados</b>	<b>15</b>
<b>No reunían criterios quirúrgicos</b>	<b>4</b>

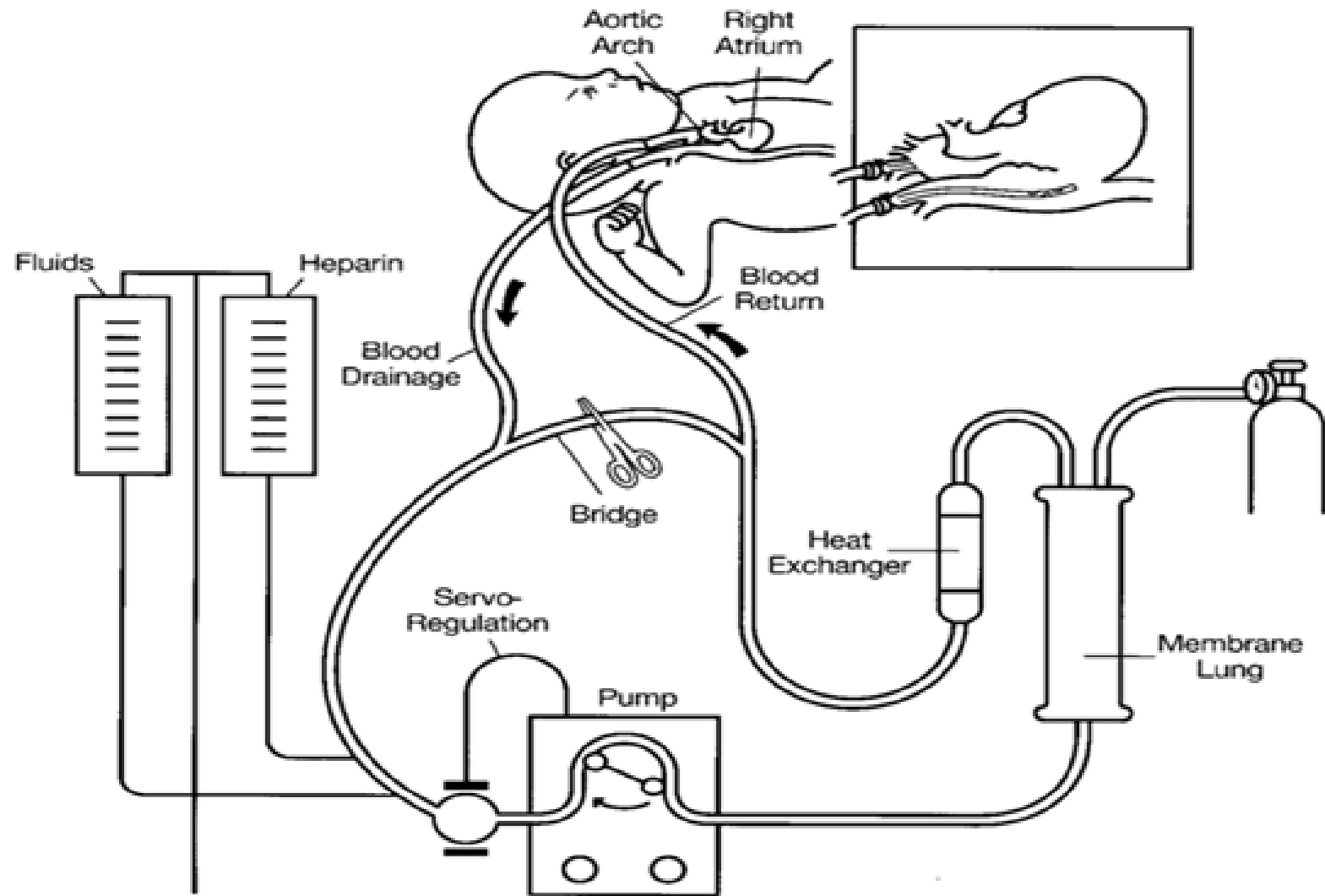
# TRASPLANTE CARDÍACO

## ESTRATEGIAS PARA ESTABILIZAR LA CONDICIÓN CLÍNICA

- INOTRÓPICOS- ARM-
- PG-
- ECMO
- AVM
- HIBRIDO

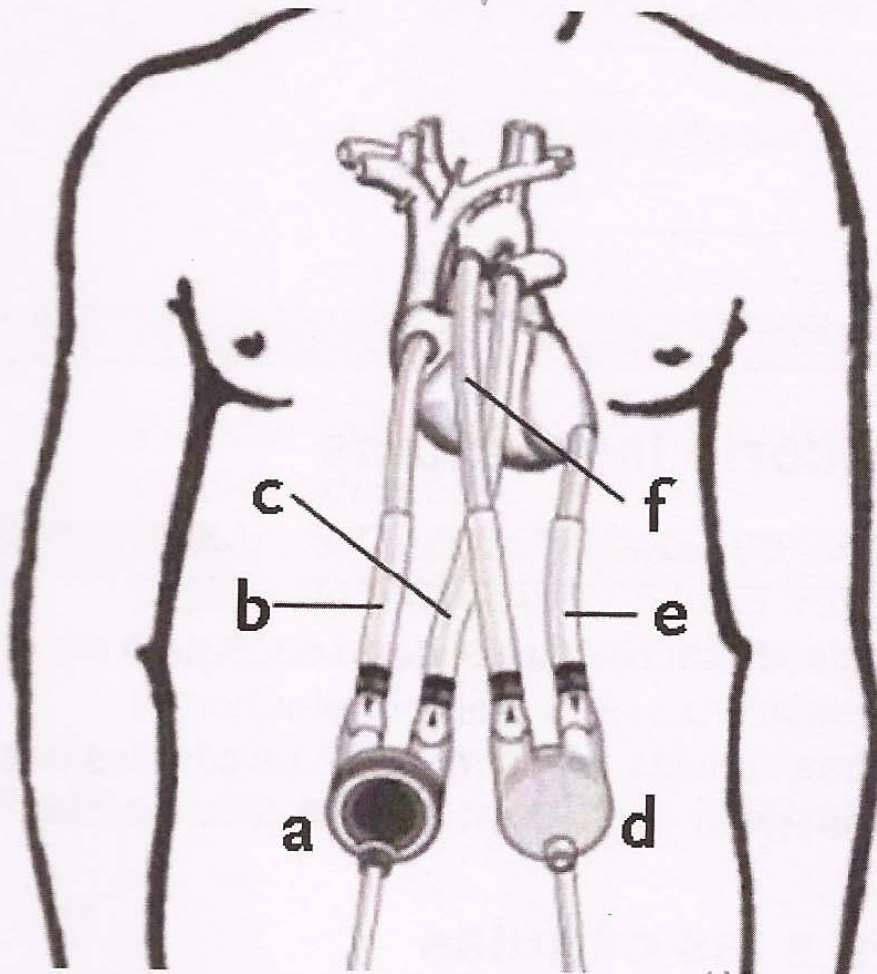


# ECMO





# ASISTENCIA VENTRICULAR MECÁNICA



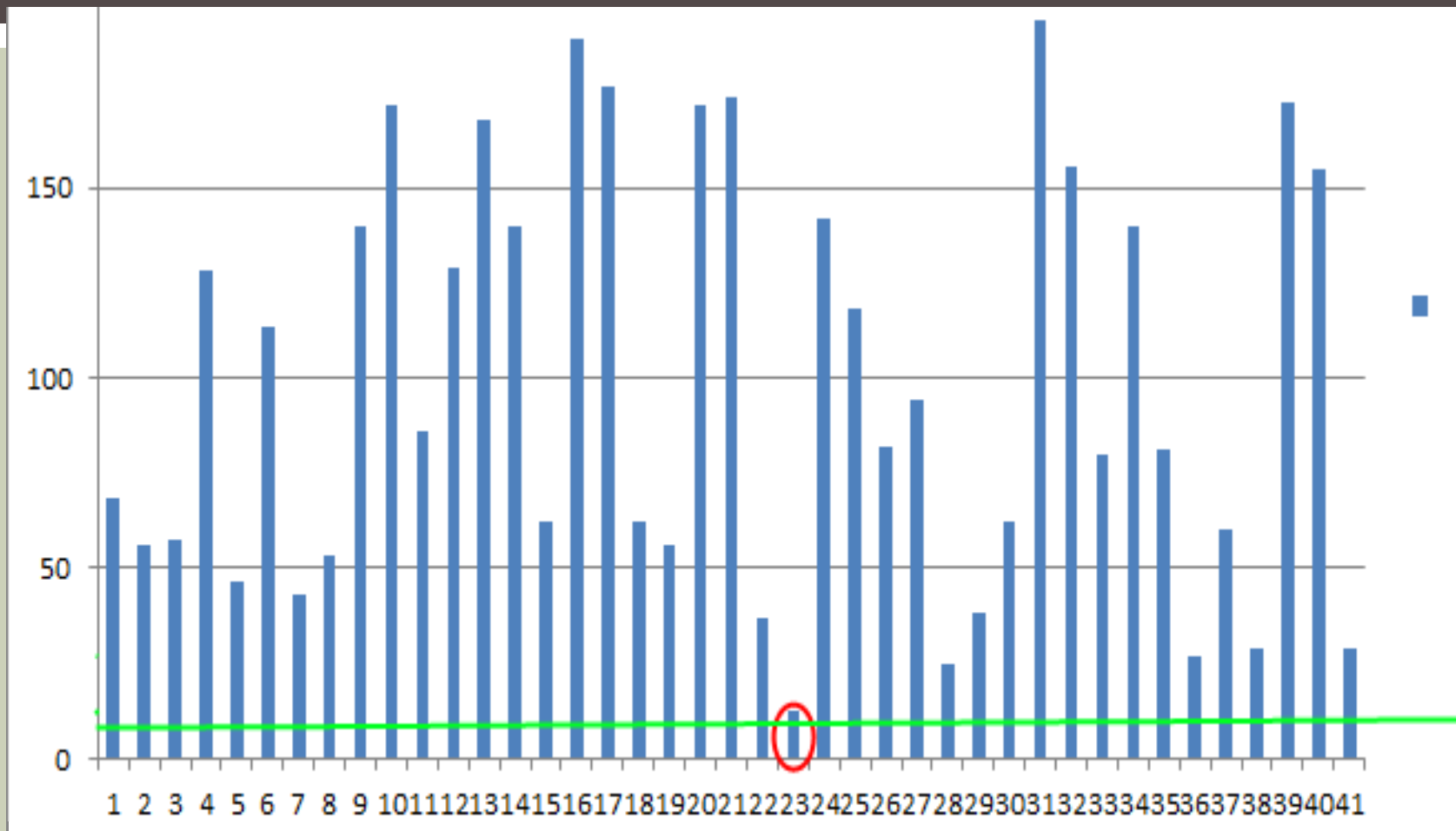
- a bomba derecha (cámara de aire mira hacia arriba)
- b cánula de entrada de la aurícula derecha
- c cánula de salida a arteria pulmonar
- d bomba izquierda (cámara de sangre mira hacia arriba)
- e cánula de entrada del ápex
- f cánula de salida hacia la aorta ascendente

Fig. 8-14 Posición final de las bombas de sangre, p. ej.: BVAD con canulación del ápex del VI

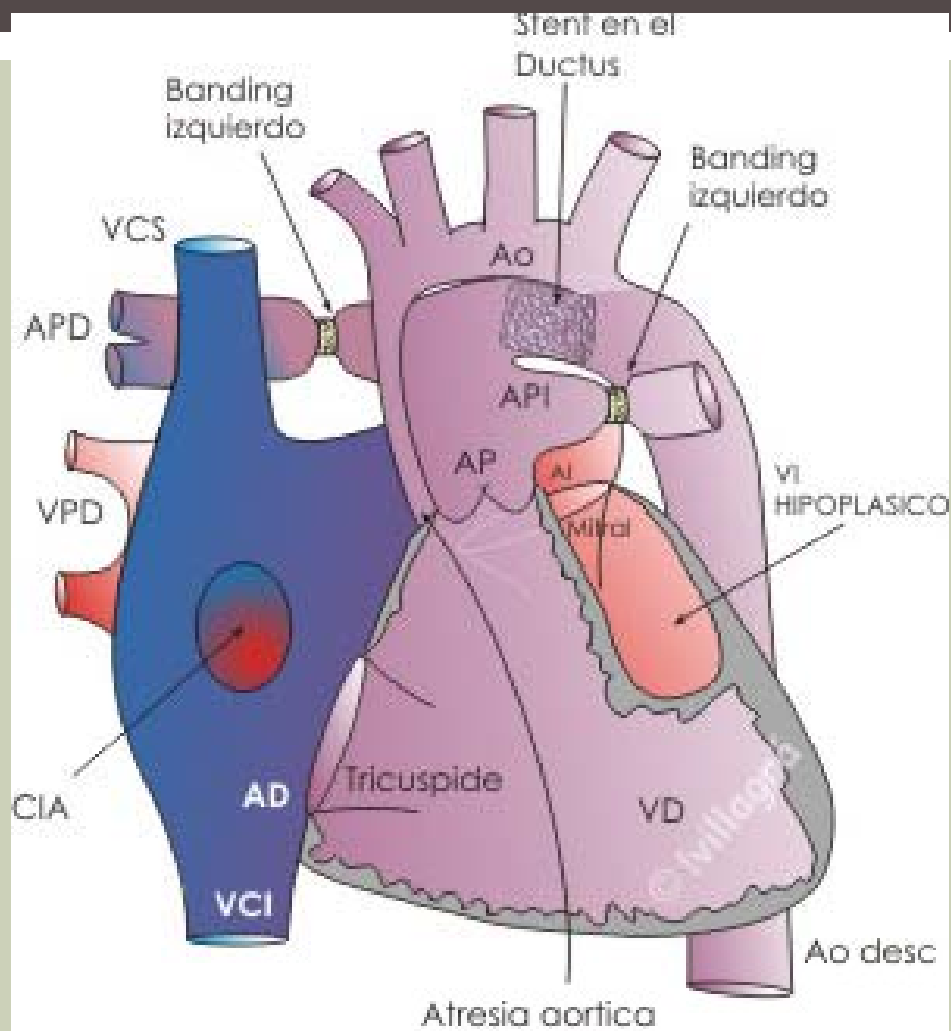


# TRASPLANTE CARDÍACO

## EDAD EN MESES AL INGRESO EN VAD



# TRASPLANTE CARDÍACO HLHS. HÍBRIDO



NORWOOD HÍBRIDO. Stent en ductus



# TRASPLANTE CARDÍACO INCREMENTO DONANTES

INCOMPATIBILIDAD ABO-

AUTOINJERTO-

DESPUÉS DE LA DETERMINACIÓN CARDIOCIRCULATORIA DE LA MUERTE?

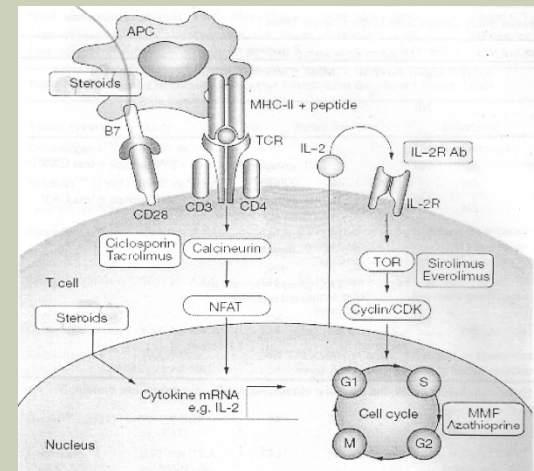


Figure 1 Schematic of mechanisms of action of immunosuppressive drugs. T-cell proliferation

# TRASPLANTE CARDÍACO INCREMENTO DONANTES.



The Journal of  
Heart and Lung  
Transplantation

<http://www.jhltonline.org>

## FEATURED ARTICLES

### Identifying potential heart donors among newborns undergoing circulatory determination of death

Mudit Mathur, MD,<sup>a</sup> Dana Castleberry, RN, CPTC,<sup>b</sup> and Leela Job, MD<sup>c</sup>

*From the Divisions of <sup>a</sup>Pediatric Critical Care and <sup>c</sup>Neonatology, Loma Linda University Children's Hospital, Loma Linda, California, and <sup>b</sup>OneLegacy, Los Angeles, California.*

#### KEYWORDS:

Neonatal intensive care unit (NICU); pediatric intensive care unit (PICU); donation after

**BACKGROUND:** Infants younger than 1 year old have the highest heart transplant wait-list mortality. Transplantation from donors after circulatory determination of death (DCDD) is an innovative new option for these patients. We examined the potential for heart donation in neonatal intensive care unit (NICU) patients undergoing elective withdrawal of life support.

**METHODS:** Medical records of all patients who died between June 2003 and June 2008 in our 84-bed NICU were reviewed. The mode of death among potential organ donors (weight > 2.5 kg) was

# TRASPLANTE CARDÍACO INSCRIPTOS LISTA CORAZÓN

## 13. Pacientes agrupados por grupo etáreo

Lista de espera	<10	10~17	18~24	25~29	30~39	40~49	50~59	60~69	>=70	TOTAL
1*RENAL	33 (1%)	84 (1%)	274 (4%)	345 (6%)	1076 (18%)	1312 (21%)	1448 (24%)	1138 (19%)	407 (7%)	6117
15*CORNEAS	2 (0%)	42 (1%)	249 (8%)	230 (7%)	550 (18%)	436 (14%)	420 (14%)	468 (15%)	700 (23%)	3097
3*HEPÁTICA	28 (2%)	24 (2%)	45 (4%)	30 (2%)	57 (5%)	191 (15%)	364 (29%)	428 (34%)	86 (7%)	1253
11*PULMONAR	-	9 (5%)	22 (12%)	11 (6%)	23 (12%)	24 (13%)	48 (25%)	51 (27%)	1 (1%)	189
2*RENOPANCREÁTICA	-	-	2 (1%)	17 (12%)	59 (40%)	49 (33%)	20 (14%)	-	-	147
8*CARDIACA	11 (9%)	5 (4%)	2 (2%)	2 (2%)	13 (11%)	18 (15%)	38 (32%)	24 (21%)	4 (3%)	117
16*ESCLERAS	-	1 (3%)	3 (10%)	2 (6%)	2 (6%)	5 (16%)	3 (10%)	8 (26%)	7 (23%)	31
4*HEPATORRENAL	-	1 (4%)	1 (4%)	2 (8%)	2 (8%)	5 (21%)	8 (33%)	4 (17%)	1 (4%)	24
12*PANCREÁTICA	-	-	-	3 (21%)	2 (14%)	6 (43%)	3 (21%)	-	-	14
14*INTESTINAL	11 (100%)	-	-	-	-	-	-	-	-	11
9*CARDIOPULMONAR	-	1 (13%)	1 (13%)	-	2 (25%)	4 (50%)	-	-	-	8
10*CARDIORRENAL	-	-	-	-	1 (50%)	1 (50%)	-	-	-	2
6*HEPATOINTESTINAL	-	1 (100%)	-	-	-	-	-	-	-	1
<b>TOTAL</b>	<b>85 (1%)</b>	<b>168 (2%)</b>	<b>599 (5%)</b>	<b>642 (6%)</b>	<b>1787 (16%)</b>	<b>2051 (19%)</b>	<b>2352 (21%)</b>	<b>2121 (19%)</b>	<b>1206 (11%)</b>	<b>11011</b>

Fuente INCUCAI

# TRASPLANTE CARDÍACO

## CONCLUSIONES

- EL TRASPLANTE NEONATAL EN NUESTRO PAÍS ES POSIBLE
- TIENEN MUY BUENA SOBREVIVENCIA, MEJOR QUE LOS TRASPLANTADOS A MAYOR EDAD
- ES NECESARIO CONTINUAR CON EL ESFUERZO PARA INCREMENTAR LA DONACIÓN Y LA RECEPTIVIDAD DE LOS PACIENTES NEONATOS.



**MUCHAS GRACIAS**

