

Long distance transport and retrieval of neonates



Newborn Emergency Transport Service
Mobile Intensive Care for Babies

Dr Steven Resnick
Medical Director NETS WA



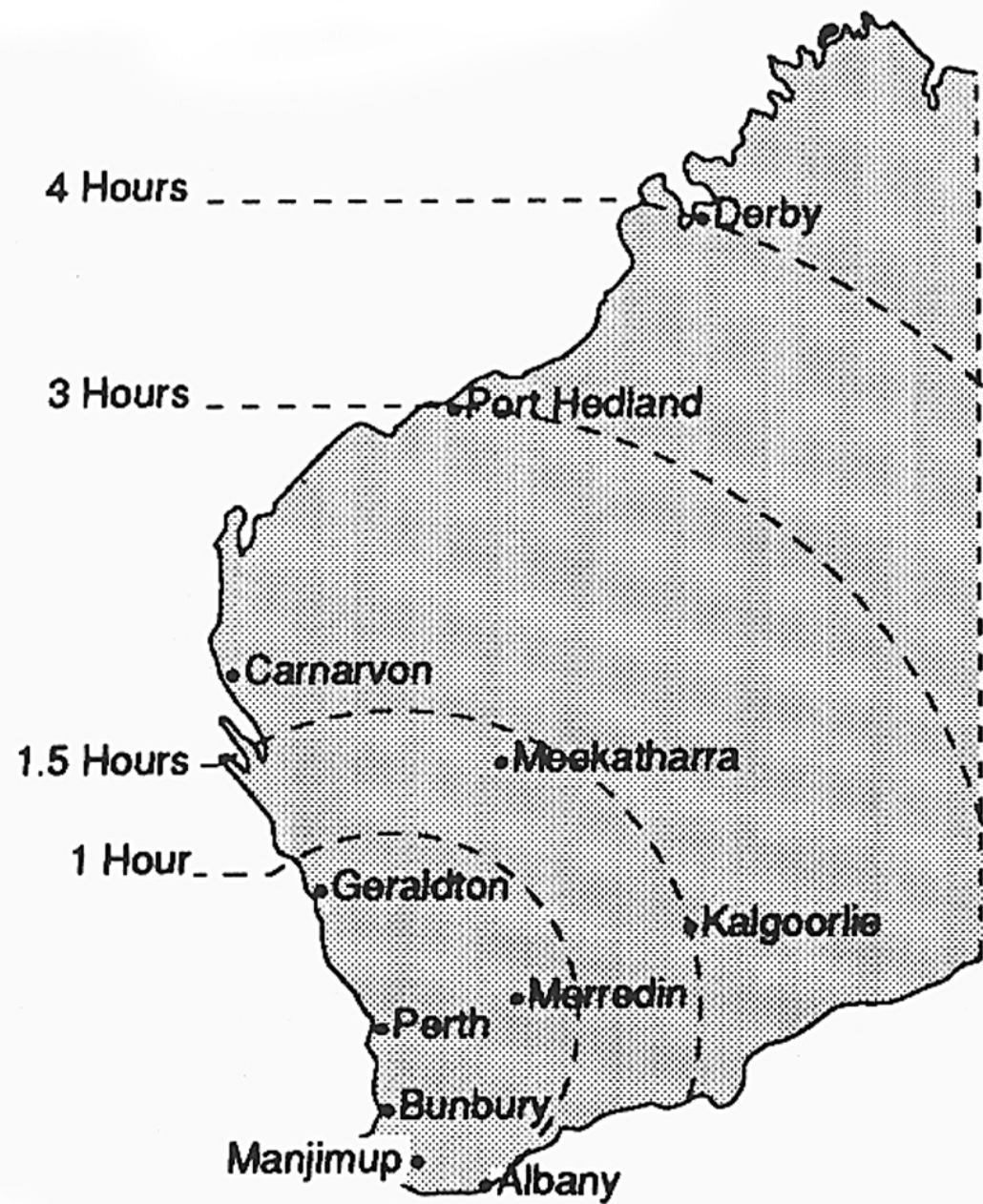
Western Australia

- Largest state in Australia
- Spans 2400km
- Area 2.5million km²
- Population 2.2 million
- Annual birth rate 30,000
- Most isolated capital city in the world
 - Unique environment for retrieval/transport

RFDS Bases in Western Australia







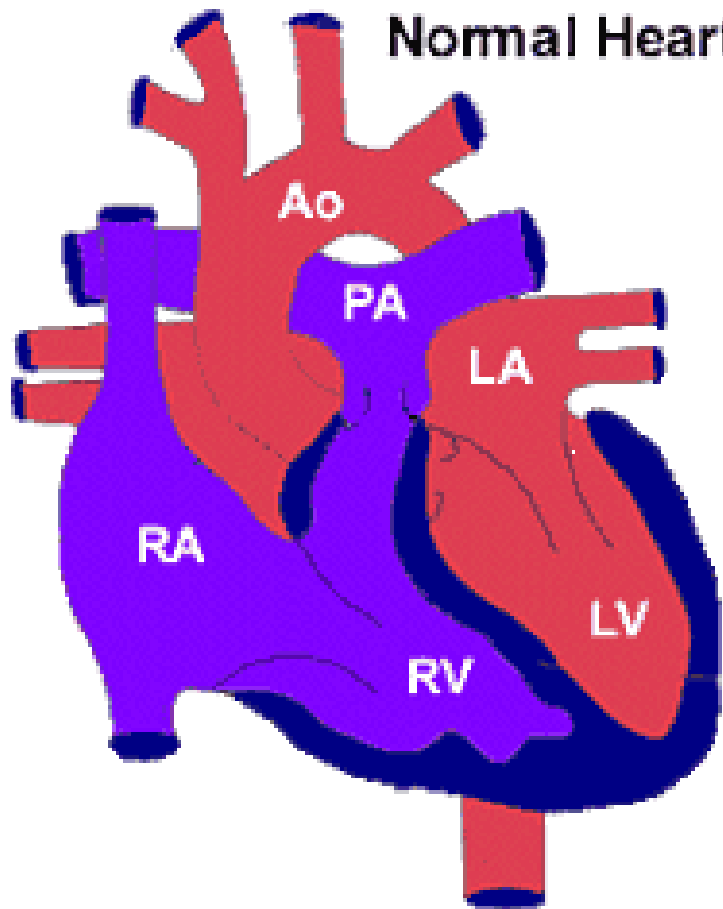
NETS WA

- One of the first neonatal transport services in Australia
- Developed in the early '70s
- Originally called WANTS
- MAIN OBJECTIVE
 - to facilitate the safe transfer of sick or preterm infants to tertiary referral centre
- 850 emergency transports/year
- 10 interstate transports
 - Neonates with CHD

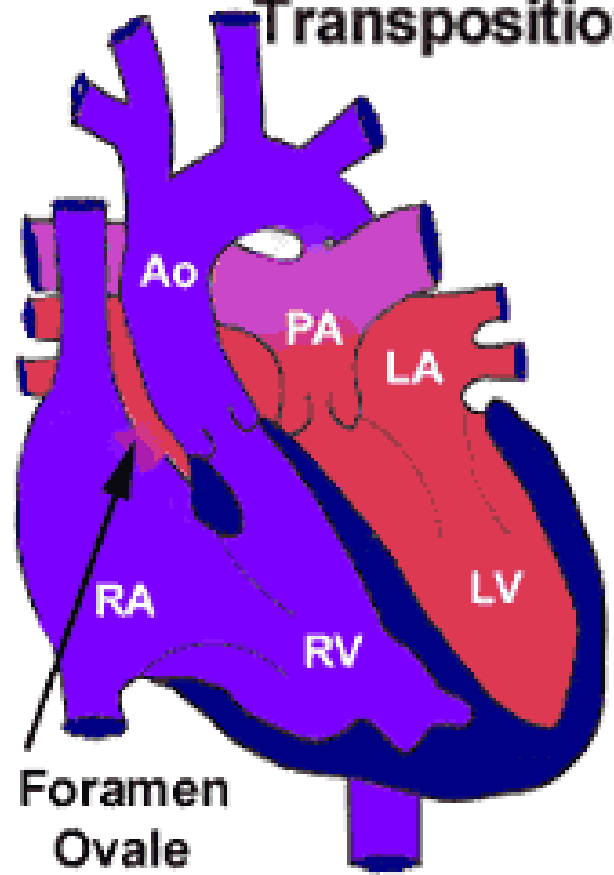
Congenital heart disease

- Incidence of ~ 10/1000 live births in WA
- Of these, 2-3/1000 have **critical conditions requiring intervention in infancy.**
 - TGA
 - Coarctation/ interrupted aortic arch
 - Hypoplastic left heart
 - Truncus arteriosus
 - Pulmonary atresia

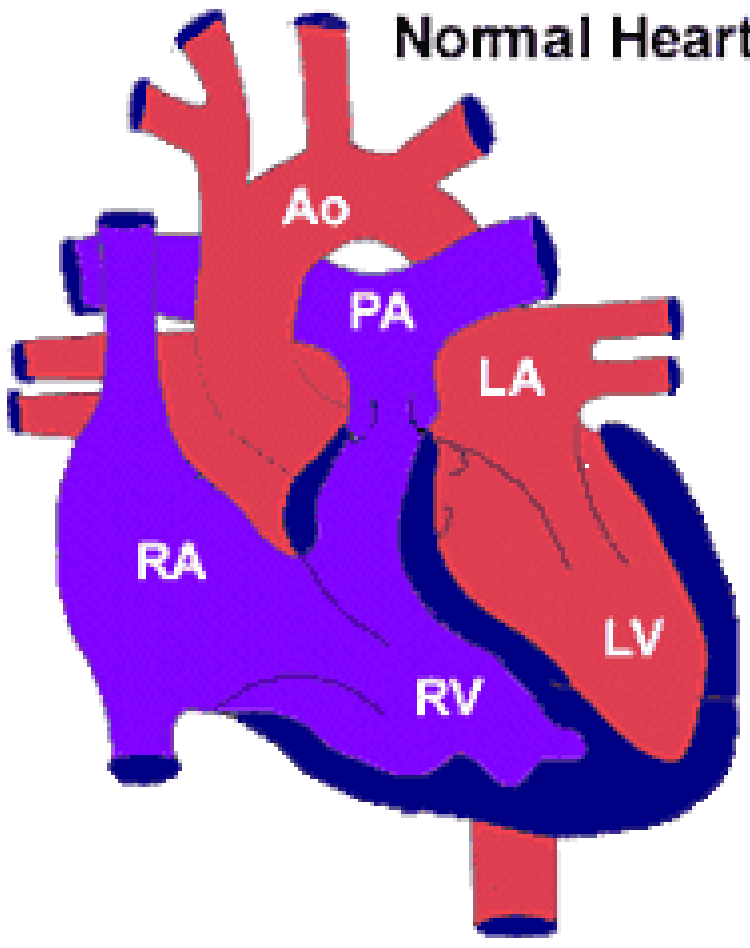
Normal Heart



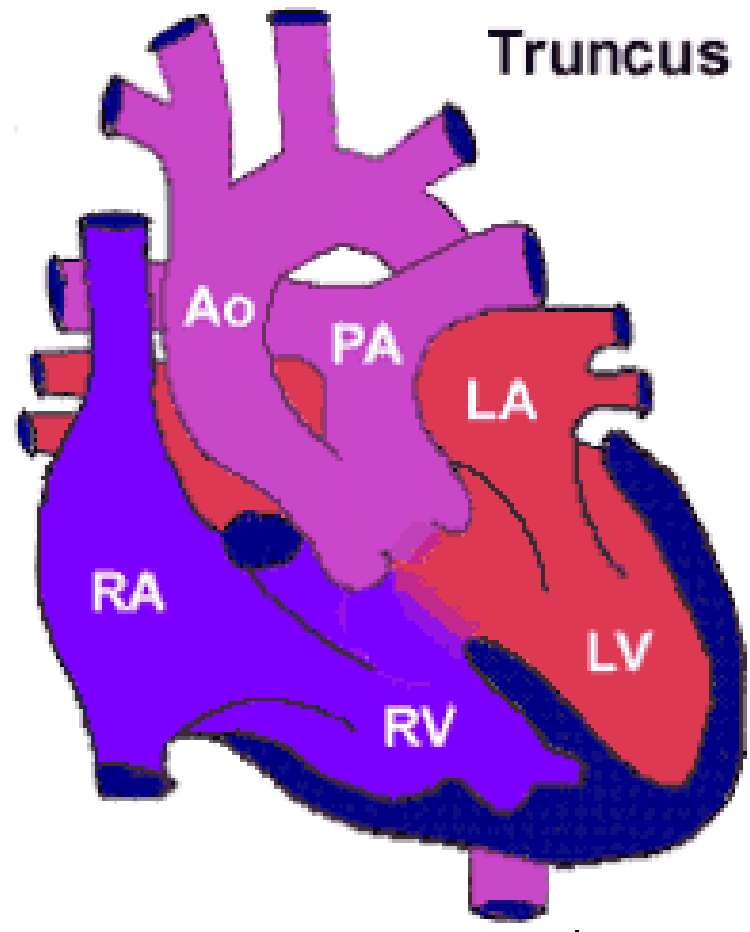
Transposition

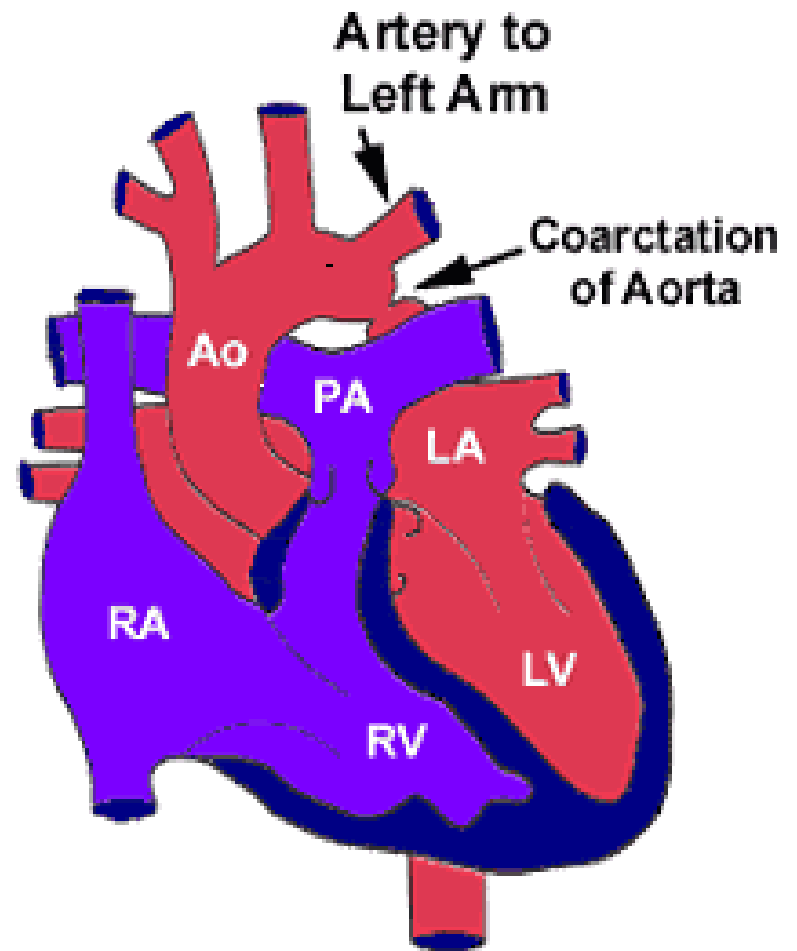
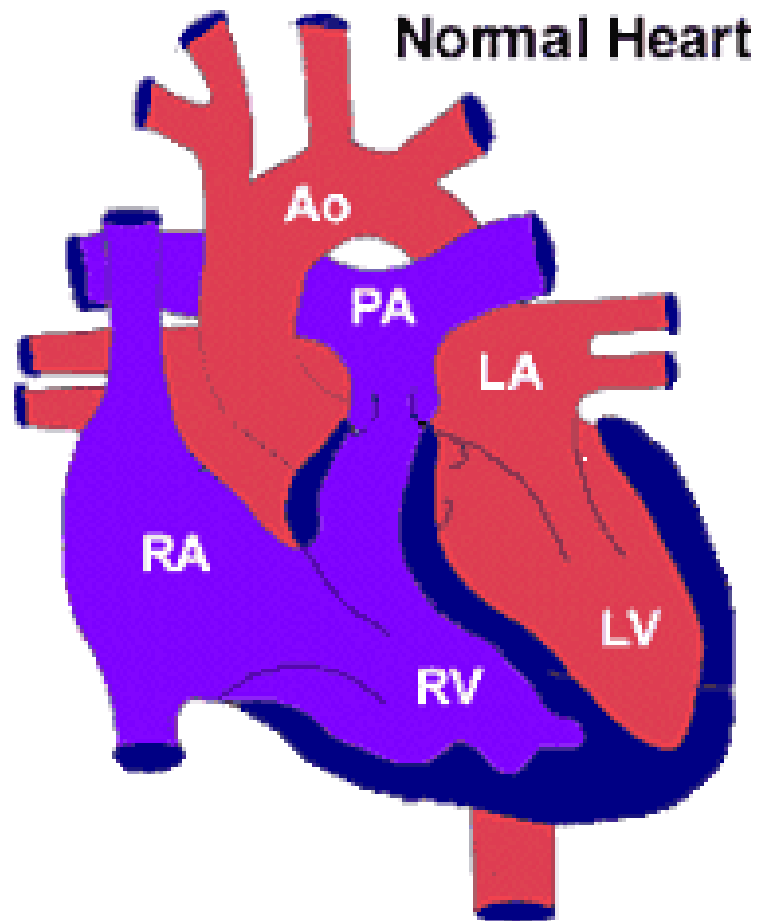


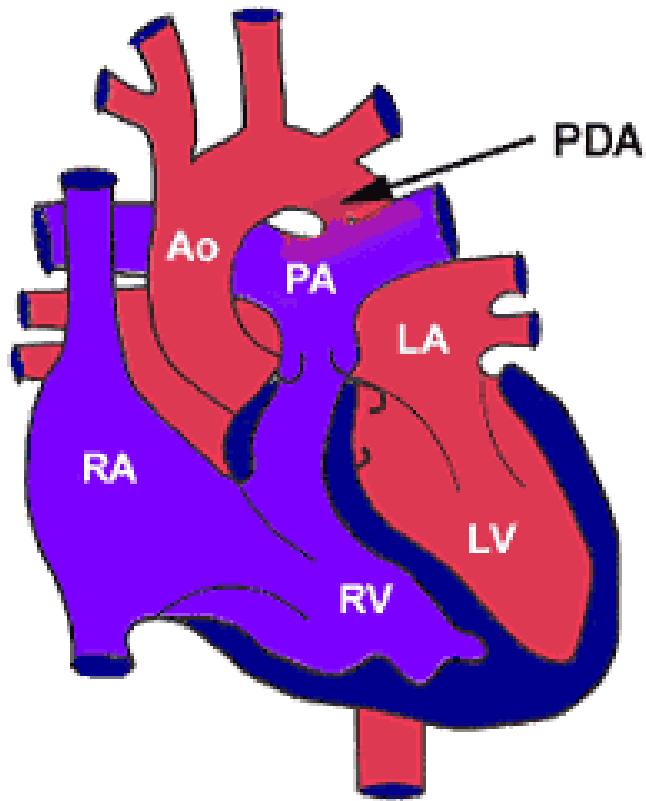
Normal Heart



Truncus







- Maintaining ductal patency with PGE1 infusion

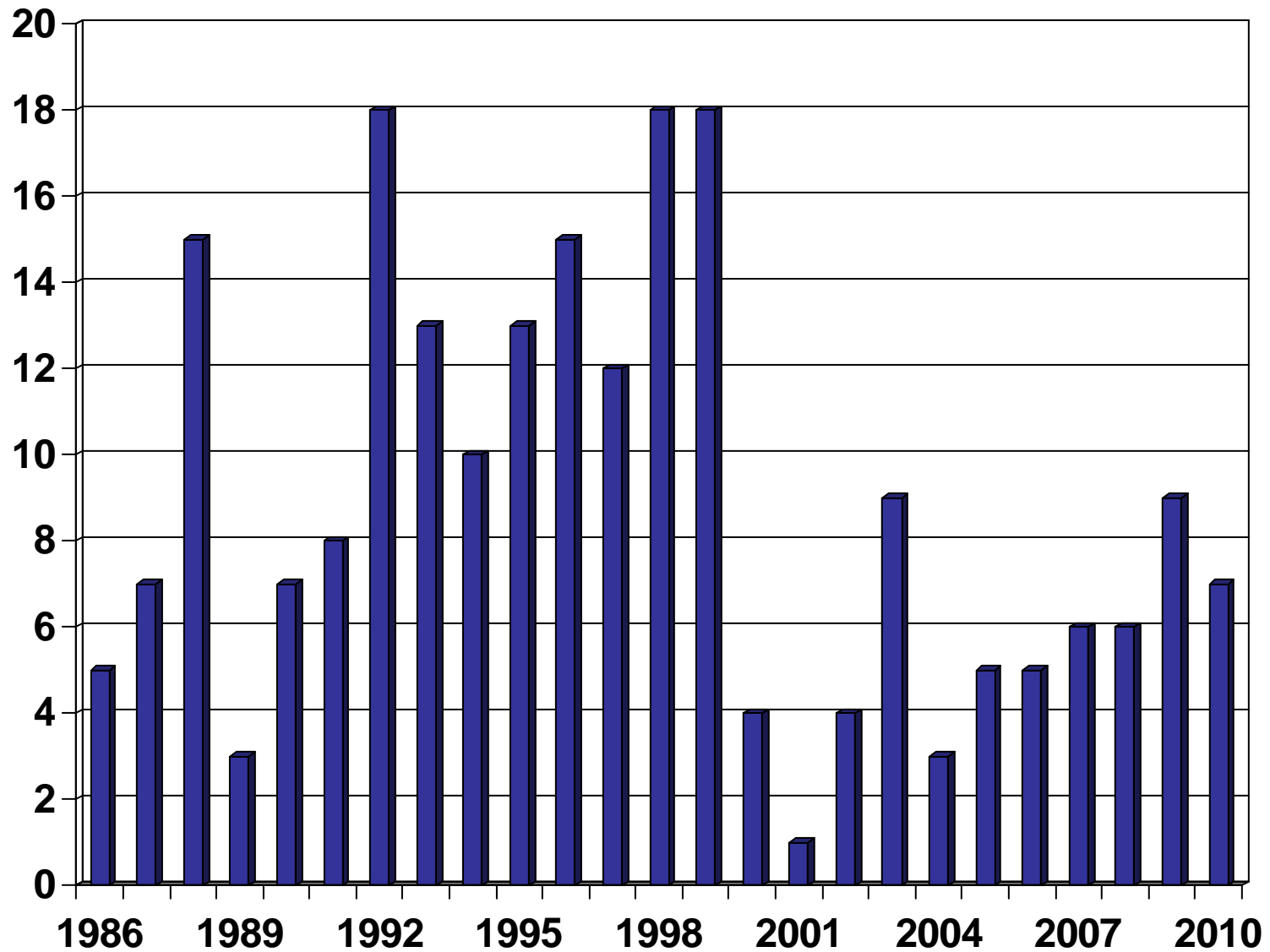
Local history

- 1st Arterial switch operation performed in Melbourne in 1983
 - Preceded by Senning/ Mustard procedures
- Early 1980's:
 - Population of WA ~ <1 million
 - 21,000 births/year
- Limited neonatal cardiac surgery in Perth
- Adult cardiac surgeons from RPH
 - Coarct repairs/ PDA ligations
 - Senning (poor results)

Interstate transports

- 1st interstate transport to Melbourne 1986
 - “supraregional centre”
- Since then, 250 neonates transported across the country
 - Primarily Melbourne (~3000km)
 - More recently Brisbane (~3600km)





CARDIAC NEONATES TRANSPORTED INTERSTATE

Why the need?

- Small population, caseload
- Difficult to upskill, especially for complex cases
- Single cardiac surgeon
- Paediatric cardiac surgery not just about the surgeon!
 - Cardiac anaesthetists
 - Perfusionists
 - ICU
 - ECMO...

Bristol Royal infirmary inquiry

- Public enquiry into the management of the care of children receiving complex cardiac surgery between 1984 & 1995.
- Focussed on open-heart surgery in <1yr age group
 - Mortality rates for Arterial switch double those of other centres
 - 30-35 excess deaths between 1991 & 1995

Bristol Royal infirmary inquiry

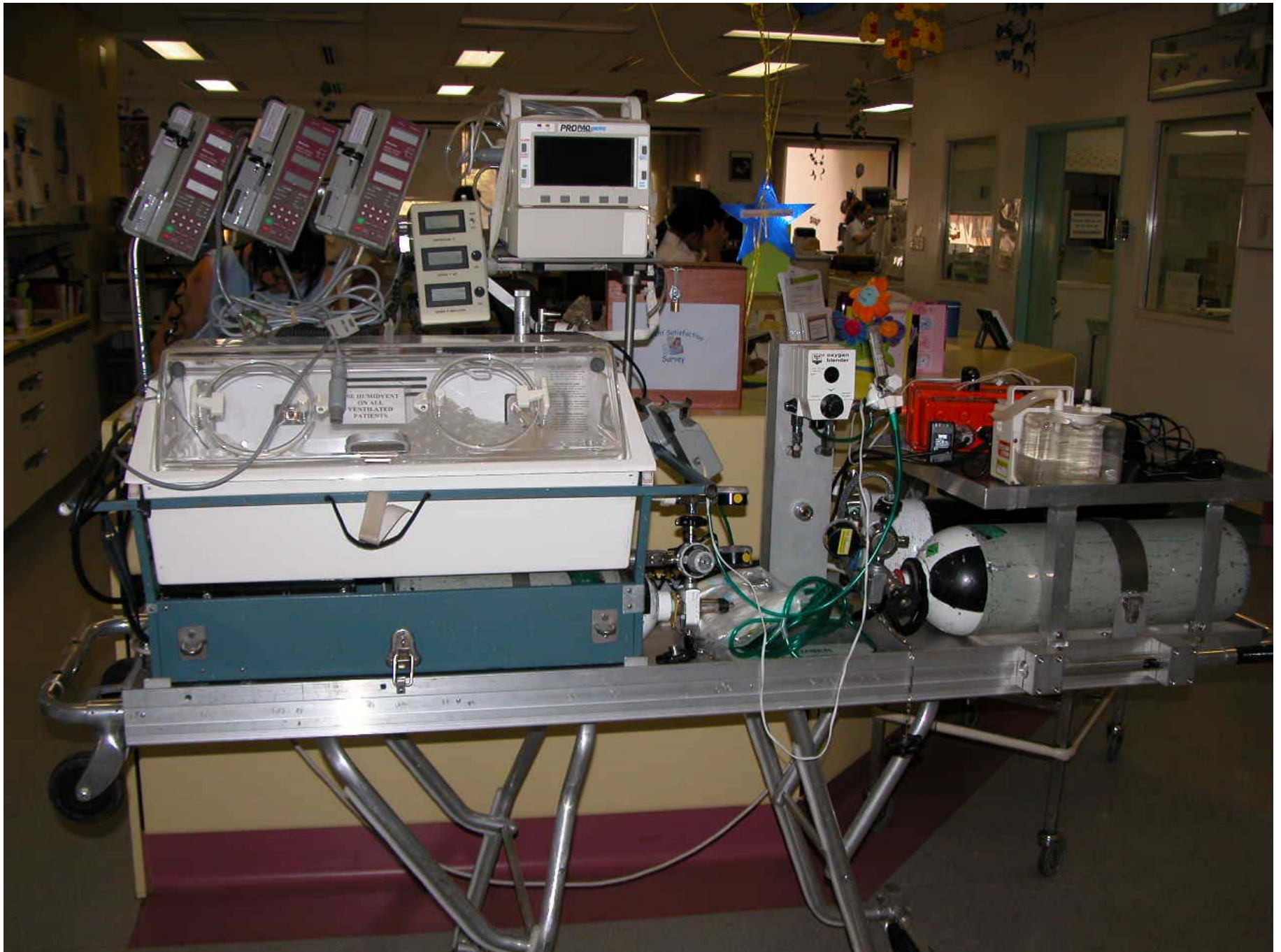
- Treatment was divided between 2 sites:
 - Cardiologists at children's hospital
 - Surgeons at adult hospital
 - Surgeons operated on adults & children
 - Children cared for in mixed ICU (alongside adults).
- Conclusion:
 - “The system for delivering PCS services in Bristol was frankly not up to the task.”
 - Bristol should not have a been a designated supraregional centre for open heart PCS.

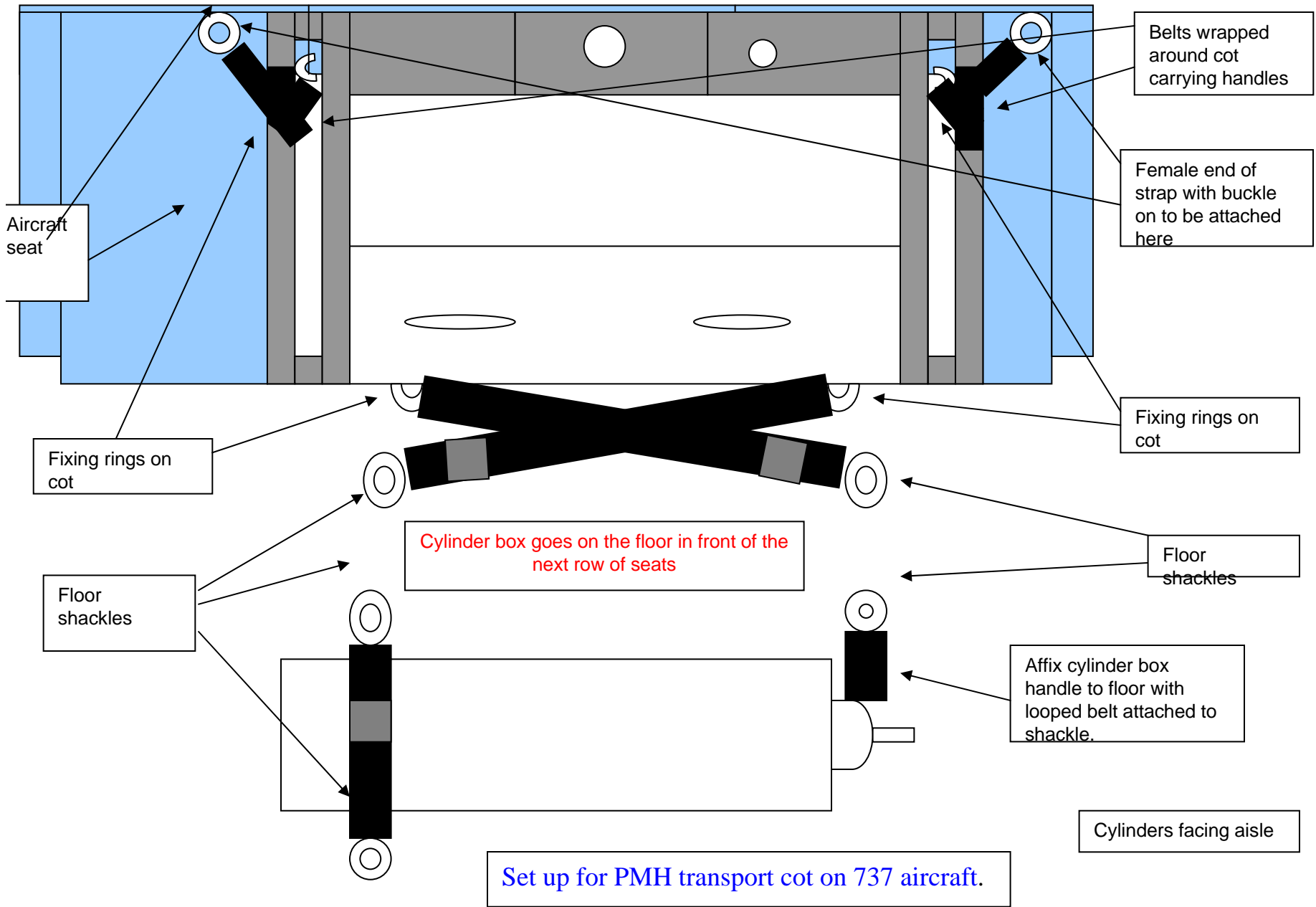
The way it was...



Equipment

- Commercial aircraft (Qantas/ Ansett)
- Specially adapted transport cot
 - Vickers Model 77 MK3
 - In-built ventilator, battery
 - Strapped down on 3 seats
 - Row in front blocked off: 2-3 D-size cylinders of air &/or O₂.
 - Biomedical engineer
 - Nurse & doctor
 - Accommodation
 - Parents







Outcomes

- 250 patients transported
 - 165 (65%) on PGE1 infusion
 - 100 (40%) ventilated
 - 55 (22%) on inotropes
- Morbidity:
 - Mostly stable (90%)
 - No accidental extubations
- Mortality: 1 (0.4%)

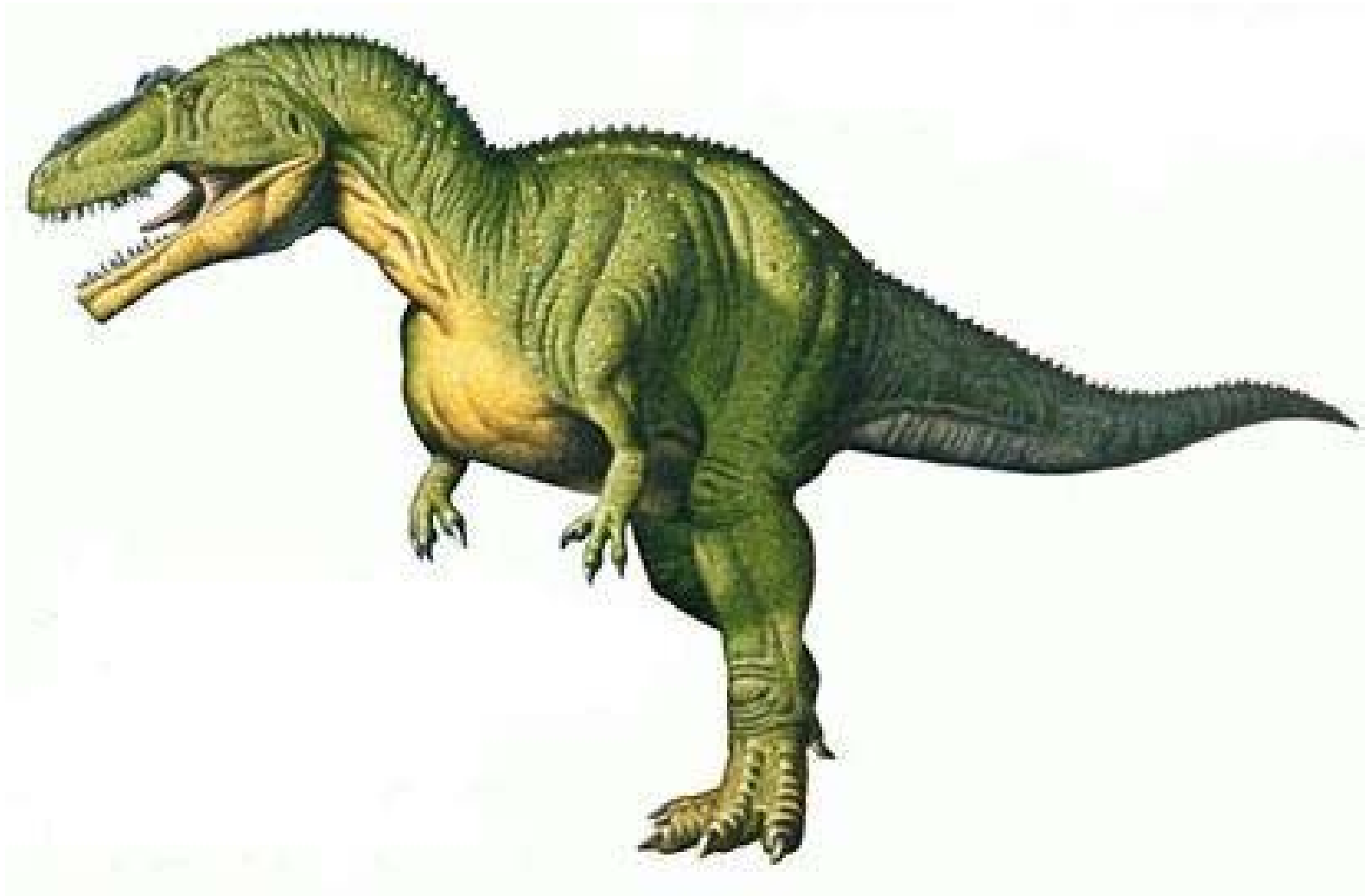
Diagnoses of transported patients

- Duct-dependent lesions:
 - TGA
 - Coarct/ interrupted arch
 - Hypoplastic LH
- Truncus arteriosus
- TAPVR

Transport complications

- Logistical/ equipment issues:
 - Organising flights
 - Flight delays
 - “cot had been used for 2 transports night prior; batteries failed 1 hr out of Melbourne”
 - “had to carry cot down flight of stairs”
 - “ambulance was just a Tarago van.”
 - Nosy passengers
 - Return journey
 - Ageing equipment





CareFlight







ROYAL FLYING DOCTOR SERVICE

O F A U S T R A L I A







Dedicated air ambulance

- “Unlimited” power and oxygen supply.
- Available at short notice.
- Flight time similar to commercial aircraft, but substantial time saved on the ground (loading and unloading directly into the ambulance.)
- Loading into and out of the jet is effortless.

- 15 transports
 - 9 Brisbane (Careflight)
 - 6 Melbourne (RFDS)

Chilean ash cloud's round-the-world tour

From: *AFP*

June 18, 2011 5:29PM



RFDS mercy dash to beat the ash

KATE BASTIANS, Yahoo!7 June 15, 2011, 2:25 pm



RFDS fly despite the ash cloud as baby Bronwyn Bevan is prepared for a life saving flight to Melbourne. Picture: Ian

Herald Sun

Desperately ill baby girl in low-flying mercy dash to Melbourne

Nathan Mawby, Olga Galacho

From: [Herald Sun](#)

June 16, 2011 12:00AM





Newborn Emergency Transport Service
Mobile Intensive Care for Babies





Rare events

- 28 week twins born in Bali
- Australian parents
- 1st twin died
- 2nd twin RDS/ sepsis
 - On CPAP
 - Deteriorating, considering ventilation
 - No blood gas facilities
- ++ logistic issues
- Careflight

DOCUMENT
OF IDENTITY

AUSTRALIA

Type / Type

F

Code of issue / Code de délivrance

AUS

DOCUMENT No.

A2000261



Nationality / Nationalité

AUSTRALIAN

Date of birth / Date de naissance

04 MAR 2010

Sex / Sexe

F

Date of issue / Date de délivrance

13 MAR 2010

Date of expiry / Date d'expiration

27 MAR 2010

Authority / Autorité

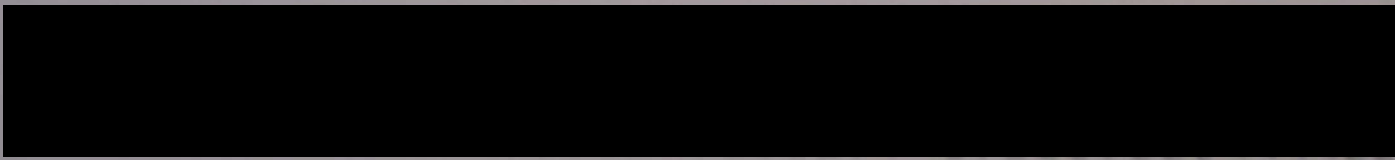
BALI



Date of issue / Date de délivrance

DENPASAR

Holder's signature / Signature de titulaire







Newborn Emergency Transport Service
Mobile Intensive Care for Babies

