



LUNG DONOR MANAGEMENT IN THE CONTEXT OF A MULTI-ORGAN DONOR

LUNG MANAGEMENT IN DONORS

Internationally only 10% to 20% of the donor pool are converted to viable lung donors

WHY?



Incidence of common physiological derangements in brain-dead donors

Derangement	Cause	Approximate incidence
Hypothermia	Hypothalamic damage; reduced metabolic rate; vasodilation and heat loss	Invariable if not prevented
Hypotension	Vasoplegia; hypovolaemia; reduced coronary blood flow; myocardial dysfunction	81 ¹⁴ –97% ²⁵
Diabetes insipidus	Posterior pituitary damage	46 ²⁵ –78% ³⁵
Disseminated intravascular coagulation	Tissue factor release; coagulopathy	29 ⁴⁵ –55% ²⁵
Arrhythmias	‘Catecholamine storm’; myocardial damage; reduced coronary blood flow	25 ¹⁴ –32% ²⁹
Pulmonary oedema	Acute blood volume diversion; capillary damage	13 ²⁵ –18% ¹⁴

REASONS FOR LOW PROCUREMENT IN LUNG DONORS

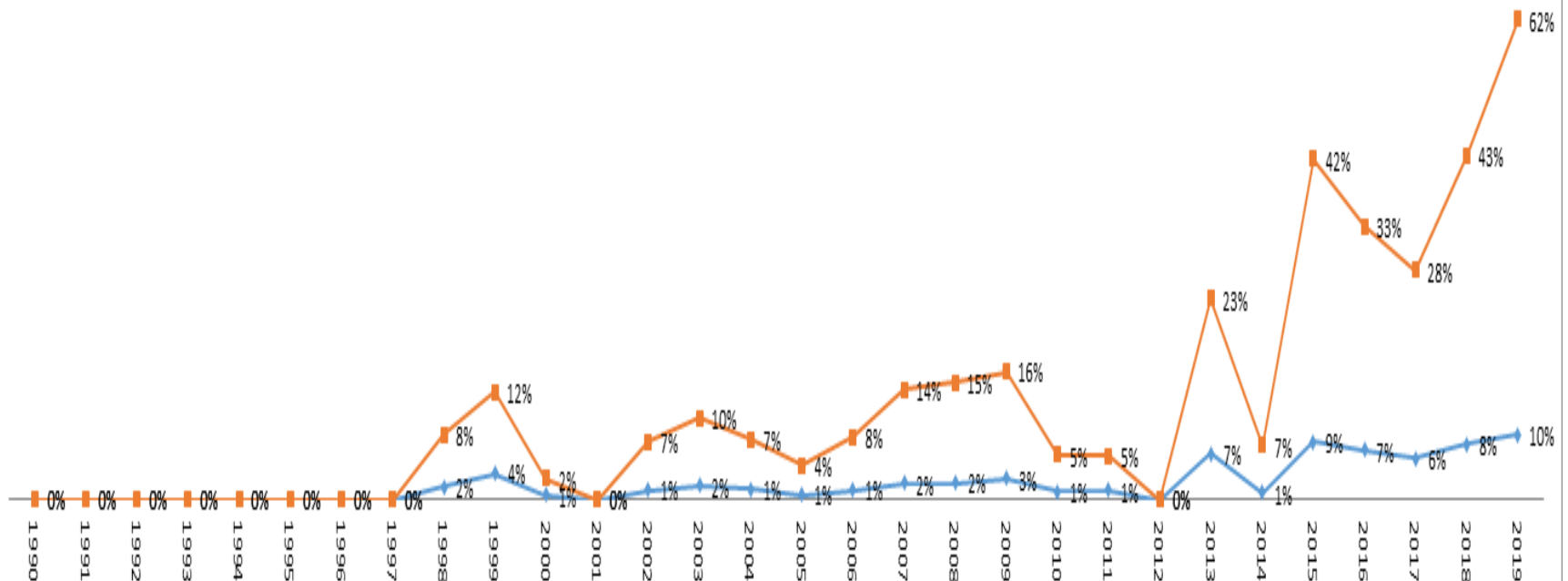
- Poor donor management prior to procurement
- Improvements have been single parameters
- Cut off value of PaO₂ / FiO₂ too high
- Guidelines driven by prevailing knowledge
- Support is considered time consuming and intensive



CONVERSION RATE FOR LUNGS IN SOUTH AFRICA

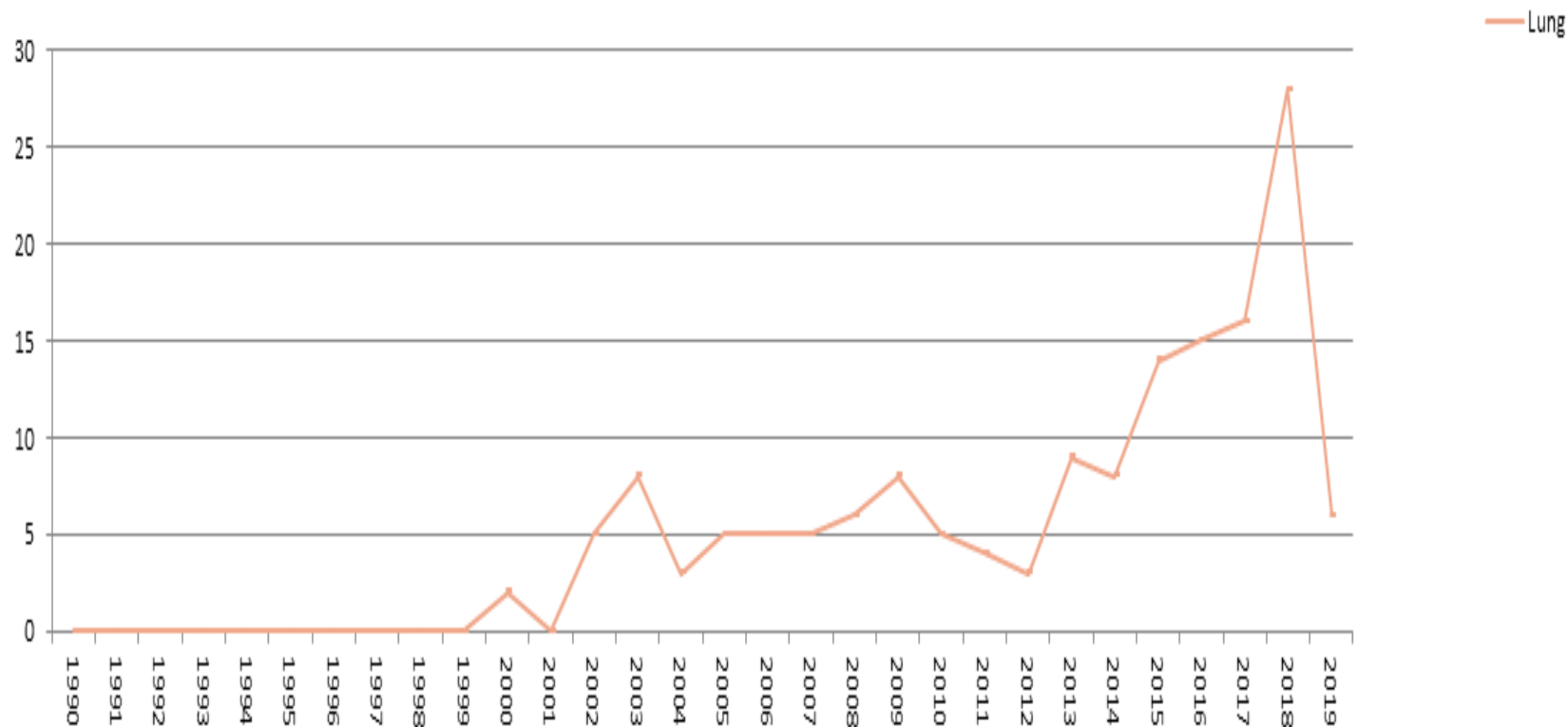
Lung Transplant Patient Donor to viable lungs for transplant 1990 - 2019

— ◆ — %Referral conversion to Lung Transplant — ■ — % Harvest conversion to Lung Transplant



LUNG TRANSPLANT STATS IN SOUTH AFRICA

MILPARK TRANSPLANTS 1990 - 2019 Calendar Year



How can we fix this!



WHAT HAS WORKED INTERNATIONALLY

Organ-protective intensive care

- Differentiated volume and catecholamine therapy
- Lung-protective ventilation
- Maintaining homeostasis (electrolyte, acid-base balance)
- Preventing loss of heat
- Administration of methylprednisolone
- Consider extended hemodynamic monitoring
- Consider administration of desmopressin, vasopressin
- Consider administration of dopamine



Table 1 Lung Donor Management Protocol

1. Apnea test performed with ventilator (continuous positive pressure mode).
2. Mechanical ventilation with PEEP 8–10 cm H₂O and tidal volume 6–8 ml/kg.
3. Recruitment maneuvers once per hour and after any disconnection from the ventilator.
4. Bronchoscopy with bilateral bronchoalveolar lavage immediately after brain death.
5. Hemodynamics closely monitored with PICCO system; goal EVLW <10 ml/kg (with administration of diuretics if necessary) and CVP (objective) <8 mm Hg.
6. Methylprednisolone (15 mg/kg) after brain-death declaration.
7. Alveolar recruitment with controlled ventilation (plateau pressure limit of 35 mm Hg) with PEEP of 18–20 cm H₂O for 1 minute and decreasing by 2 cm H₂O each minute; then increasing 50% tidal volumes for 10 breaths.
8. In those lung donors with PaO₂/FIO₂ <300 mm Hg, semi-lateral decubitus position plus recruitment maneuvers.

CVP, central venous pressure; EVLW, extravascular lung water; PEEP, positive end-expiratory pressure.

Table 4 Annual Number of Recovered and Implanted Lungs and Transplanted Patients Before (2010 to 2012) and After (2013) Protocol Implementation

	<u>Total</u>		<u>Lung transplant hospitals</u>		<u>Non-lung transplant hospitals</u>	
	2010-2012 ^a	2013	2010-2012 ^a	2013	2010-2012 ^a	2013
Recovered lungs	37	87	25	41	12	46
Implanted lungs	27	62	18	30	9	32
Transplanted patients	19.7	41	13.3	21	6.3	20

Data presented globally and depending on donation hospital (with or without lung transplantation program).

^aAnnual average.

WHAT CAN WORK IN SOUTH AFRICA

- Early and Aggressive Donor management
- Update donor management protocols
- Relax and repair rather than rush and retrieve
- Cheap, Easy and Effective in South Africa
- Adopt advanced monitoring methods
- On call access to Transplant Intensivists



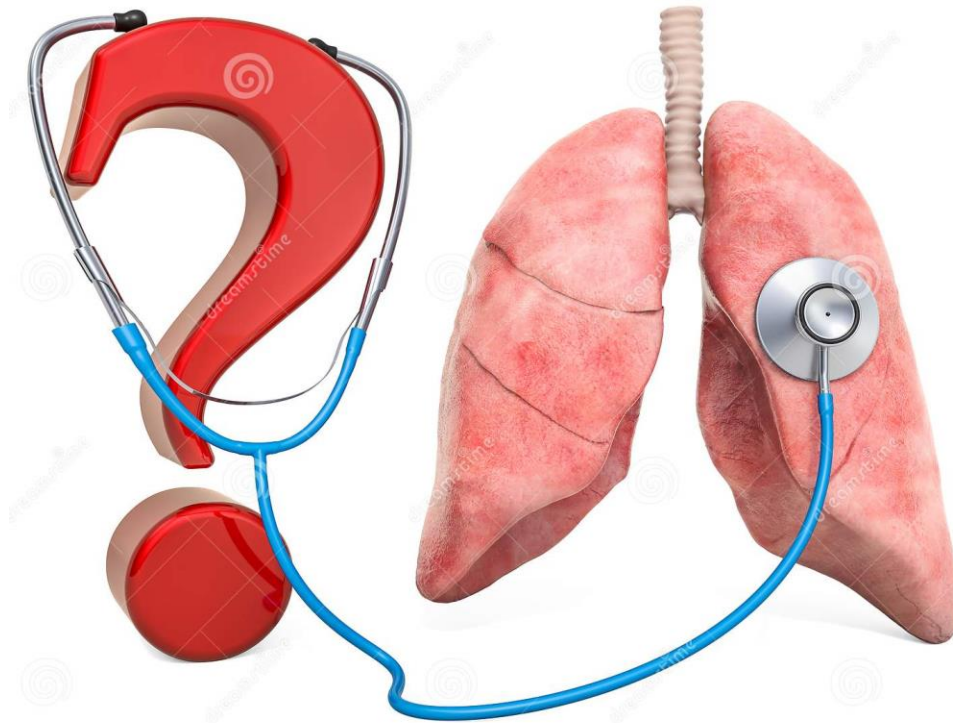
ECMO AND EX-VIVO PERFUSION



CONCLUSION

In brain stem dead patients that progress to multi-organ donation, the approach needs to be aimed at properly monitored and balanced resuscitation with the ongoing maintenance of all organ systems and ensuring end organ perfusion so that the greatest number of organs are suitable for transplant

COMMENTS??



Thank You, to my Colleagues, Team
Doctors, Management and Patients
and to SATS for offering me this
opportunity to present this talk today

