



PAEDIATRIC DONOR WORKING GROUP (PDWG) RECOMMENDATIONS

1. Donor identification

a. All children who die in intensive care should be considered for potential organ donation.

The rate of organ donation in children is similar to adults but this rate declines with decreasing age. This is likely to be due to a combination of factors primarily medical unsuitability and age and weight limits for procurement and transplantation.

There is a tight interconnection between donor identification/ work-up and subsequent transplantation. Secure knowledge that a potential donor has a likelihood of being suitable for transplantation is key to the donation sector, but equally, encouragement of increased transplantation from these donors is likely to come with increased numbers of referrals. Work needs to be done to optimize donor identification in paediatric and neonatal intensive care units as well as clear criteria around the suitability of transplantation of organs, particularly from the smallest of these donors. The updated organ-specific donor criteria below provide confirmation of the interest by transplanting units in being offered these donors. However, it is acknowledged that there is a broad range of experience in the transplantation of organs from small paediatric donors and not all units will feel it is appropriate to consider all donors according to the criteria below. In order to facilitate the pathway for allocation of these organs it is important that transplant units develop processes to identify limits on paediatric donors they are willing to accept as well as local experts who are available for discussion of cases with donation coordinators.

b. Donatelif e audit should extend to report on mortality outcomes for all children born at ≥37 weeks gestation, including those aged <28 days.

Robust data on the number of paediatric donors identified and outcomes of offers, accepted or rejected, and subsequent transplantation need to be audited. Current Donatelif e data acquisition would not capture neonatal donors <28 days of age, although these children are within the criteria for liver and heart donors, as below. In order to better understand the potential for neonatal donation, we recommend extending the Donatelif e audit to all children who die in intensive care units, aged between term and 28 days.

2. Recommendations for paediatric kidney donation (SK- single kidney, EB- en-bloc)

Age and Size Range	SK or EB	Allocation
>20kg or >5yo	SK	Standard allocation
>10-20kg or >1-5yo	EB first, then SK in certain cases	Standard allocation with default to offer as en-bloc. Recipient transplanting unit has discretion to opt for SK, in which case second kidney to be offered on as SK.
>5-10kg or >3-12mth	EB	Allocation proceeds only after pre-allocation discussion with local experts. Referral should be accompanied by standardized paediatric-specific donor variables.



<5kg or ≤3mo	EB	Only for allocation as part of a research/centre-specific program. These donors do warrant further investigation with rigorous protocols in dedicated centre(s) with relevant expertise
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Notes

>5- 10kg, >3-12mth – this is a broad category with implications, particularly for the smallest donors, for limitations in surgical experience of both donor retrieval and recipient surgery. Ideally, these organs should be managed in centres committed to develop experience for small grafts and have clear protocols on how to manage them. Consensus of the working group members was that centres should pre-emptively discuss their readiness and capacity to transplant small organs and make the donation sector aware of this in order to streamline the allocation process. Centres indicating their readiness to transplant very small organs would also be suitable to nominate one or more of their senior transplant physicians and surgeons to act as local experts to provide pre-allocation advice to donation staff.

Given the relative lack of experience with procurement and transplantation of very small organs, it was felt that it would be useful to provide some paediatric-specific data at the time of pre-allocation discussion and subsequent offer. Evidence-based criteria to guide post-transplant outcomes in these donors are not established and audit of the recommended criteria below will be important to assess their utility and validity.

By consensus, the working group recommends that in addition to routine donor information, offers of very small paediatric donors are accompanied with the following documented data:

- antenatal factors: normal antenatal morphology scan, absence of oligohydramnios, absence of history of transmissible infection;
- gestational age at birth and/or reduced size for gestational age;
- renal ultrasound with details of kidney/ ureter/ bladder anatomy and kidney size percentile for age;
- presence of extra-renal congenital anomalies or syndrome with likelihood of systemic impact affecting the kidneys
- renal function- creatinine with normal range for age and gestation
- acute illness factors: history of central/ umbilical vascular catheterization +/- thrombosis

3. Recommendations for paediatric liver and/ or intestinal donation

Age and Size Range	Allocation
DBD- No lower limit for age or weight. DCD- only donors >3mth age will be considered for liver donation. DCD donors are not suitable for intestinal donation.	Liver donation: Refer to local liver transplant unit first then, if no suitable recipient, refer to other units in rotation. Preferential allocation of donor liver to recipients requiring combined liver and intestinal transplant, as guided by TSANZ organ allocation guidelines. Intestinal donation: All referrals to Victorian Liver Transplant Unit.



4. Recommendations for paediatric lung donation

Age and Size Range	Allocation
>8kg and/or <120cm and/or <13yo	Allocation to Paediatric Lung Transplant NFC (Alfred Health), both DCD and DBD

The recipient criteria set out by the Nationally funded centre (NFC) paediatric Lung and Heart-Lung Transplantation program allows lung transplantation for children ≥ 4 years and >10 kg. Reflecting that children this small may have restrictive lung disease and a small chest cavity, smaller paediatric donors may be suitable as above. Lungs from donors >120 cm or >13 yo should be allocated as for adult donors.

5. Recommendations for paediatric heart donation

Age and Size Range	Allocation
>3kg	Formal referral of all cases, both DBD and DCD.

Paediatric cardiac transplant recipients can derive significant benefit from infant donors with median survival exceeding those of older children. Any donor weighing more than 3 kg is deemed potentially suitable. For infants with severe heart disease an early decision on pursuing wait-listing for cardiac transplant vs mechanical support (VAD) is often necessary. An understanding of the size of the donor pool and likely waiting time is critical in informing this decision. Accordingly, it is recommended that all potential donors >3 kg be formally assessed for organ donation. Prior discussion with the transplant team to determine if there is a suitable recipient should only be undertaken if this is the express wish of the family.

6. Recommendations for paediatric pancreas donation

Donor Size	Allocation
>25kg	DBD suitable for solid organ or islet donation.

Paediatric DBD donors >25 kg are suitable for pancreatic donation. These should initially be offered for solid organ donation and if not allocated then offered for islet donation. Paediatric DCD donors are not currently suitable for pancreas donation.

7. Recommendations for paediatric tissue donation

Due to jurisdictional governance issues, definitive recommendations are not possible, but small paediatric donors as small as 3kg are able to donate certain tissues. Tissue donation from paediatric deaths is assessed on a case by case basis and must be conducted in accordance with jurisdictional legislation (e.g. some jurisdictions have specific requirements for children who die whilst in care of the state).

Assessment of medical suitability is best undertaken in conjunction with associated tissue banks. Decision making will be influenced by predicted tissue need and compliance with mandated regulatory risk assessment criteria. In broad terms:

- heart valve donation may be possible from donors greater than 3kg;
- eye donation from 2 years;
- musculoskeletal donation from 15 years;
- skin donation from 17 years.



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Of note, If the donor is <18 months of age or <6 months beyond breast-feeding, whichever is the greater time, the risk assessment criteria applies to the birth mother as well as the child.

8. Recommendations for future research

a. All organs

- i. Development of collaboration with international centres and registries with experience in the use of paediatric and neonatal donors. This would be ideally mediated by an international committee resourced to have face-to-face and remote meetings.
- ii. Qualitative, patient-centered studies:
 1. Experience of families of small paediatric donors of the process of donation
 2. Survey of acceptability of small paediatric donors to wait-listed recipients
- iii. Evidence-based risk stratification of risk factors for small paediatric donors
- iv. Long-term follow-up of transplantation:
 1. Graft and patient survival
 2. Rates of rejection
 3. Vascular complications
 4. Kidney donors <10kg:
 - a. Proteinuria
 - b. Donor kidney size and serial growth
 - c. Urological complications
 5. Liver donors <10kg:
 - a. Biliary complications
- v. Assessing DCD potential in infants less than 12 months old.

b. Heart donors:

- i. Rate of referral of small paediatric donors and the impact of avoiding institution of mechanical support (ventricular assist devices).

c. Kidney donors:

- i. Multi-centre study of paediatric kidney donors <5kg.
- ii. Use of ex-vivo perfusion in the use of small paediatric kidney donors
- iii. Use of small paediatric kidney donors for infant recipients
- iv. Kidney- paediatric kidney donor profile index Kidney Donor Profile Index (KDPI) based on local national data.