## Changes in this version

Addition of Section 5.2 – Paediatric Offering From Adult Donors
Figure 1 wording change to non-urgent tier

# Policy

*This policy has been created by the Cardiothoracic Advisory Group (CTAG) on behalf of NHSBT.*

*This policy previously received approval from the Transplant Policy Review Committee (TPRC). This committee was disbanded in 2020 and the current governance for approval of policies is now from Organ and Tissue Donation and Transplantation Clinical Audit Risk and Effectiveness Group (OTDT CARE), which will be responsible for annual review of the guidance herein.*

*Last updated: June 2023*
*Approved by OTDT Care: June 2023*

The aim of this document is to provide a guideline for the acceptance and allocation of donor lungs to adult and paediatric patients on the UK transplant list. These criteria apply to all recipients of organs from deceased donors.

In the interests of equity and justice all centres should work to the same allocation criteria. Non-compliance to these guidelines will be handled directly by NHSBT, in accordance with **POL198***: NHS Blood and Transplant Organ Donation and Transplantation: Policy on Non-compliance with Selection and Allocation policies.* (*http://www.odt.nhs.uk/transplantation/tools-policies-and-guidance/policies-and-guidance/*)

It is acknowledged that these guidelines will require regular review and refreshment. Where they do not cover specific individual cases, mechanisms are in place for the allocation of organs in exceptional cases that ensure equity and fairness.

The guidance in this document describes how lungs donated by deceased donors are allocated.

## 1. Policy Overview

### 1.1. *Rationale*

The rationale of the allocation system is to provide a transparent allocation process for lungs from deceased donors that balances the need to reduce mortality on the waiting list with the need to match donor lungs with recipients to provide the best outcome for all listed patients.

### *1.2. Basis of Allocation*

There are three tiers of allocation; the Super-Urgent Lung Allocation Scheme (SULAS), the Urgent Lung Allocation Scheme (ULAS) and the Non-Urgent Lung Allocation Scheme (NULAS). Selection criteria for these three schemes are documented in *POL231: Lung Candidate Selection Criteria.*
*(http://www.odt.nhs.uk/transplantation/tools-policies-and-guidance/policies-and-guidance/)*
Lungs are allocated to individual named patients on a national basis for those on the super-urgent and urgent lists. For patients on the non-urgent list, lungs are allocated on a centre basis for local allocation.

### *1.3. Patient Criteria*

Patients meeting criteria for transplantation with organs from deceased donors must be registered with NHS Blood and Transplant. Selection criteria for lung transplantation are detailed in *POL231: Lung Candidate Selection Criteria*.
(http://www.odt.nhs.uk/transplantation/tools-policies-and-guidance/policies-and-guidance/)
The person requesting registration is accountable for the accuracy of the information provided.

NHSBT will ensure that patients meet registration criteria and refer back those where the criteria are not met.

### *1.4. Transplant Centres*

There are six lung transplant centres in the UK: Birmingham, Great Ormond Street Hospital, Harefield, Manchester, Newcastle and Papworth. Newcastle transplant adult and paediatric patients, and Great Ormond Street transplant paediatric patients only. The remaining centres transplant adult patients only. Additionally, Newcastle offer lung transplant services to patients from Scotland as the transplant centre in Glasgow performs heart only transplants at present.

## 2. Donor Information

An adult lung donor is defined as a donor aged 16 years or over at the time of death. A paediatric donor is defined as a donor aged less than 16 years at the time of death. Contraindications to organ donation are reviewed regularly and revised as needed. ***POL188****: Clinical contraindications to approaching families for possible organ donation* includes lung specific contraindications.

(https://www.odt.nhs.uk/deceased-donation/best-practice-guidance/procedural-documents/)
As with all guidelines, these should be used with clinical judgement. **Appendix 1** and **2** offer additional guidance on non-retrieval criteria and acceptance criteria for donor lungs.

## 3. Recipient Information

Transplantation is associated with risk. It is the responsibility of the transplant team to ensure that the potential transplant recipient understands and accepts the risks associated with organ transplantation as well as the benefits. Obtaining informed consent is a process which involves the whole multi-disciplinary team. NHSBT and the British Transplantation Society have provided advice on consent in ***POL191****: Guidelines for consent for solid organ transplantation in adults.*
*(http://www.odt.nhs.uk/transplantation/tools-policies-and-guidance/policies-and-guidance/)*

### *3.1. Adult Patients*

An adult patient is defined as being a patient aged 16 years or above at the time of registration.

### *3.2. Paediatric Patients*

A paediatric patient is defined as being a patient aged less than 16 years at the time of registration. A paediatric patient who reaches their 16th birthday while on the waiting list will retain their paediatric status.

### *3.3. Small Adult Patients*

A Small Adult is defined as a patient aged 16 or above and of height less than or equal to 155cm (this is done automatically and does not rely on indication on the registration form) who is registered on the SULAS or ULAS. Patients meeting these criteria will generally receive offers of lungs available from paediatric donors before other adults, but after paediatric patients.

### *3.4. Patient Categories*

There are three patient categories for which a patient can be registered. Table 1 indicates which patient category (Paediatric, Small Adult or Adult) a patient is classed in depending upon the registered status of the patient (i.e. by age and height) and which type of centre they are registered at. The type of centre is important because generally a 15 year old patient, for example, registered at an adult centre will by definition be of adult size and hence require adult sized organs, whereas generally a 15 year old patient at a paediatric centre will require specialist paediatric treatment and hence paediatric sized organs. A patient will only have one classification and cannot be ‘dual listed’ to receive offers as part of more than one category. The Small Adult patient category only applies to the Urgent and Super-Urgent schemes.

| Table 1: Patient category for allocation (Paediatric/Small Adult/Adult) by patient status and centre type | | | |
|---|---|---|---|
| **Status of patient** | **Adult Centre (Harefield, Papworth, Birmingham, Manchester)** | **Adult & Paediatric Centre (Newcastle*)** | **Paediatric Centre (GOSH)** |
| **Aged under 16** | Adult | Paediatric | Paediatric |
| **Aged 16 or above (not Small Adult)** | Adult | Adult | Paediatric |
| **Small Adult** Aged ≥16 and height ≤155cm | Small Adult | Small Adult | Paediatric |

* Newcastle is counted as both an adult centre and a paediatric centre in the document

## 4. Allocation Zones

In some aspects of lung offering, 'zonal centre' priority is given to the patients at a centre when the donor is located within the centre's allocation zone. Each transplant centre is assigned an allocation zone, with the exception of Great Ormond Street. This means that every donating hospital is assigned to one of the transplant centre allocation zones, based on geography and donor density. Allocation zones are reviewed annually by CTAG and arrangements made to ensure equity for patients by adjusting the allocation zone boundaries to reflect the demand for transplantation at each centre.

The current list of hospitals in each lung allocation zone can be found on-line at https://www.odt.nhs.uk/transplantation/tools-policies-and-guidance/allocation-zones/.

## 5. Lung Offering Sequence

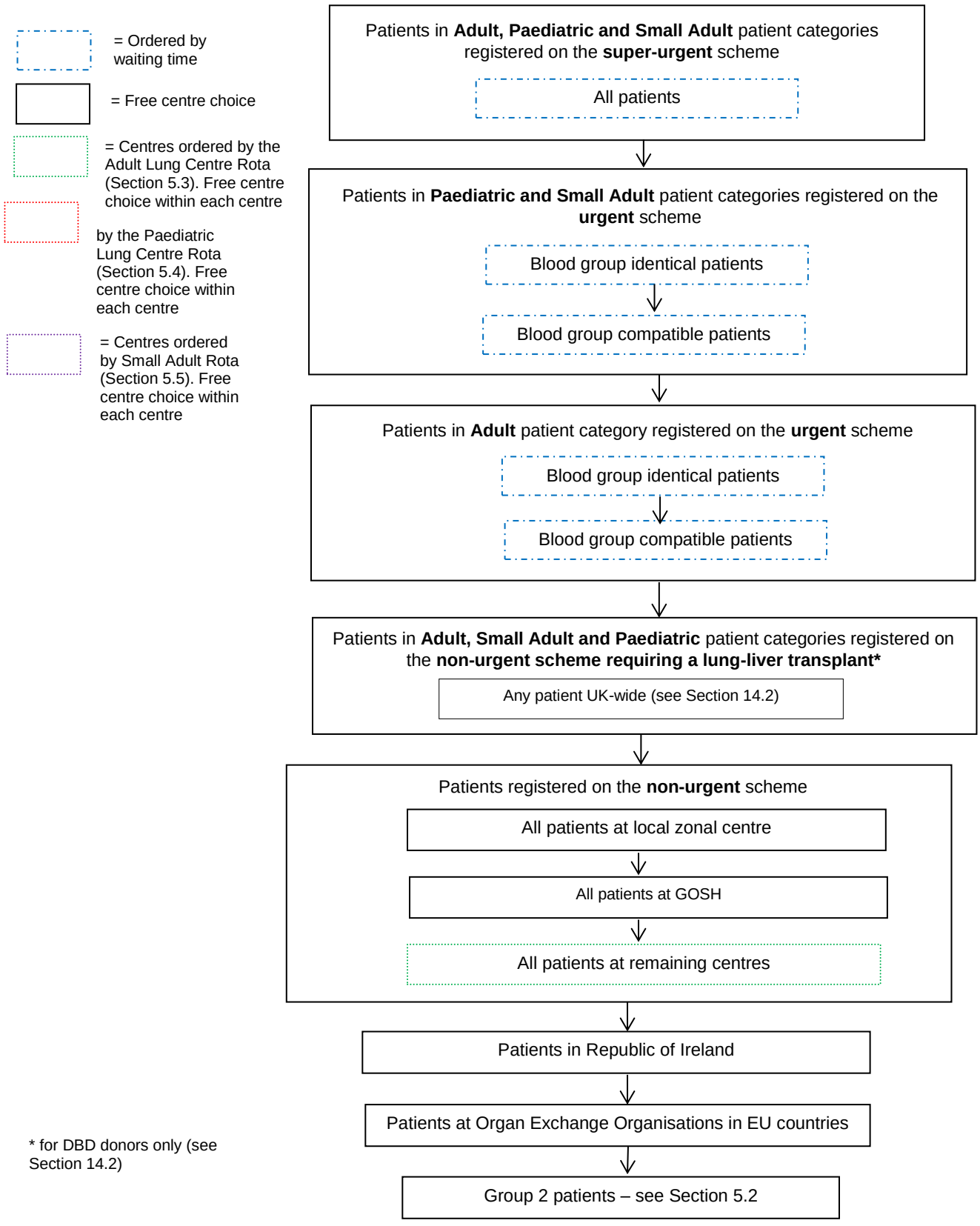
### *5.1. Group 1 Patients*

Offers are made to centres in the priority order indicated in Figure 1 for an adult donor and Figure 2 for a paediatric donor. The offering sequences are the same for DBD and DCD donors. Both diagrams describe the offering sequence for Group 1 patients only; the final step in the offering sequence is to offer to Group 2 patients (as described in Section 5.2). Group 1 and Group 2 patients are defined in the Directions of NHS Blood and Transplant and reflect NHS entitlement.
(https://www.odt.nhs.uk/odt-structures-and-standards/regulation/)

### *5.2. Paediatric Offering From Adult Donors*

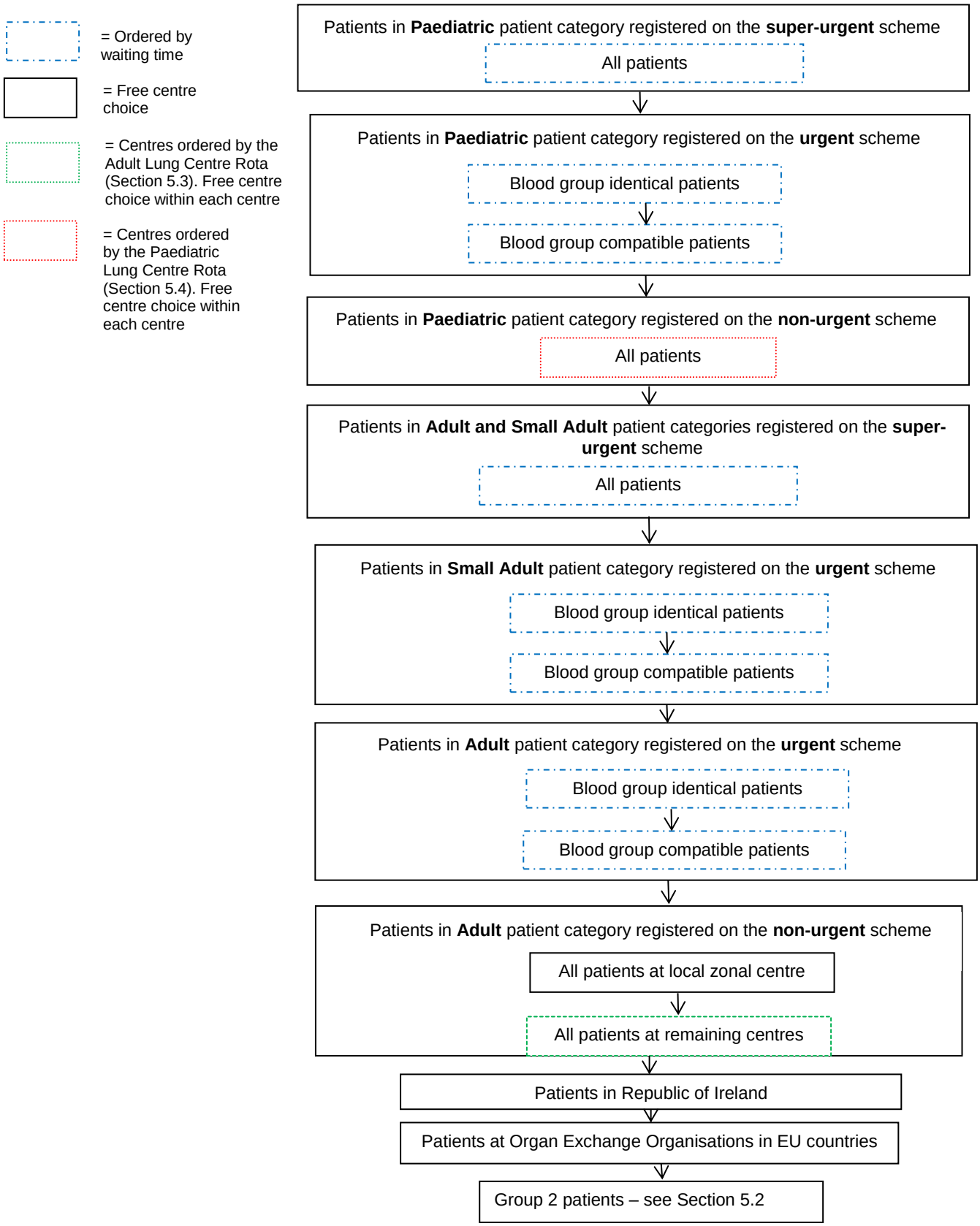
Unlike adults, it is clinically not usually feasible to deliver awake ECMO bridging therapy in children and young people (aged <16yrs). Due to the inability to safely sustain life with such bridging therapy (i.e. automatic eligibility for super-urgent listing), children and young people on the urgent lung transplant waiting list are prioritised ahead of urgent adults.

## Figure 1 Allocation for adult donor lungs (donor ≥ 16 years)




* for DBD donors only (see Section 14.2)

## Figure 2 Allocation for paediatric donor lungs (donor < 16 years)



### *5.3. Group 2 Patients*

Offers of adult donor lungs to Group 2 patients are made to centres in the following priority order:

1) The local zonal transplant centre
2) All other transplant centres in the UK, according to the Adult Lung Centre Rota (see Section 5.3)
3) Organ Exchange Organisations in EU countries

Offers of paediatric donor lungs to Group 2 patients are made to centres in the following priority order:

1) Transplant centres in the UK with a paediatric registered, according to the Paediatric Lung Centre Rota (see Section 5.4).
2) The local zonal transplant centre for adult patients
3) Centres in the UK for adult patients, according to the Adult Lung Centre Rota (see Section 5.3)
4) Organ Exchange Organisations in EU countries

### *5.4. Adult Lung Centre Rota*

Donor lungs are allocated to non-urgent patients in the Adult category (see Table 1) on a centre basis. After the zonal centre (and Great Ormond Street in the case of the adult donor sequence, Figure 1), the order in which centres are prioritised follows the Adult Lung Centre Rota, as follows:

- All adult centres are ordered in reverse-chronological order of last transplant date for non-urgent Adult patients when organs (from an adult or paediatric donor, DBD or DCD) are accepted and used from outside of their own allocation zone.
- If a centre accepts and uses an organ from within their own zone, it does not move position on the rota.
- As each centre carries out a transplant for non-urgent Adult patients using an organ donated from within the UK and imported from another zone, it will be moved to the bottom of the rota.
- A centre transplanting an organ donated from outside the UK will retain its place and not be moved to the bottom of the rota.
- A centre importing a heart-lung block for transplant into a non-urgent Adult patient will be rotated to the bottom of both the Adult Cardiac Centre Rota (**POL228** Heart Transplantation: Organ Allocation http://www.odt.nhs.uk/transplantation/tools-policies-and-guidance/policies-and-guidance/) and the Adult Lung Centre Rota.

### *5.5. Paediatric Lung Centre Rota*

Donor lungs are allocated to non-urgent patients in the Paediatric category (see Table 1) on a centre basis. The order in which centres are prioritised in the paediatric donor sequence (Figure 2) follows the Paediatric Lung Centre Rota, which consists of the two paediatric transplant centres and is as follows:

- Paediatric centres are ordered in reverse-chronological order of last transplant date for non-urgent Paediatric patients when organs (from an adult or paediatric donor, DBD or DCD) are accepted and used.
- As each centre carries out a transplant for a non-urgent Paediatric patient using an organ donated from within the UK, it will be moved to the bottom of the rota.
- A centre transplanting an organ donated from outside the UK will retain its place and not be moved to the bottom of the rota.
- A centre accepting a heart-lung block for transplant into a non-urgent Paediatric patient will be rotated to the bottom of both the Paediatric Cardiac Centre Rota (**POL228** Heart Transplantation: Organ Allocation http://www.odt.nhs.uk/transplantation/tools-policies-and-guidance/policies-and-guidance/) and the Paediatric Lung Centre Rota.

### *5.6. Allocation Within Centres*

Organs are allocated to non-urgent patients in each of the patient categories on a centre basis. This allows the clinicians to select the most appropriate recipient within their centre, based on need, benefit and other clinical issues. Most centres will allocate the lungs to the patient with the greatest need, but other factors will also need to be considered to obtain optimal outcomes. Donor factors include age, smoking history, bilateral or single lung offer and graft quality; recipient factors include their respiratory diagnosis, age, height and blood group (which together influence the chance and speed of identifying matched donors) and expected cold ischaemia time. Discussions are necessary with all patients concerning varying risk associated with some donors. Patient preferences should be considered and appropriate consent must be obtained. There should be a documented audit trail so the surgeon can justify the decision.

## 6. Super-Urgent Lung Allocation Scheme

The Super-Urgent Lung Allocation Scheme (SULAS) is available for all patient categories and the offering process differs depending on whether the donor is adult (Figure 1 and Section 6.1) or paediatric (Figure 2 and Section 6.2).

- Offers are made for named patients registered on the national SULAS waiting list in the order of their time spent waiting on the super-urgent list for this registration.
- Offers are not made to patients who are blood group incompatible with the donor.
- In addition, patients on the SULAS can be registered with gender-specific maximum and minimum donor heights they are willing to accept, at the time of registration. These patients will subsequently not receive offers of donor lungs from donors that fall outside of these specified criteria.
- If a patient is suspended from the super-urgent list for more than 14 days the centre should contact ODT Hub Operations to remove them from the waiting list. If the patient needs to be re-activated after 14 days then a new registration form will be required and their waiting time will restart from zero. Centres are responsible for informing ODT Hub Operations when a patient is to be reactivated or removed.

### *6.1. Adult Donor Lungs*

Adult donor lungs are offered to all patients in the SULAS Adult, Paediatric and Small Adult patient categories in one tier.

### *6.2. Paediatric Donor Lungs*

Paediatric donor lungs are offered to all patients in the SULAS Paediatric patient category before being offered to patients in the ULAS and NULAS Paediatric patient category (Figure 2). The donor lungs are then offered to SULAS Adult and Small Adult patients followed by ULAS Small Adult patients, ULAS Adult patients, NULAS Small Adult patients and finally to NULAS Adult patients.

## 7. Urgent Lung Allocation Scheme

The Urgent Lung Allocation Scheme (ULAS) is available for all patient categories and the offering process differs depending on whether the donor is adult (Figure 1 and Section 7.1) or paediatric (Figure 2 and Section 7.2).

- Offers are not made to patients who are blood group incompatible with the donor.
- In addition, patients on the ULAS can be registered with gender-specific maximum and minimum donor heights they are willing to accept, at the time of registration. These patients will subsequently not receive offers of donor lungs from donors that fall outside of these specified criteria.
- A patient that has moved from the SULAS to the ULAS will retain their waiting time spent on the SULAS, which will be added on to their ULAS waiting time.

- Patients moving from the ULAS to the SULAS will not retain any waiting time from their urgent registration.
- If a patient is suspended from the urgent list for more than 14 days the centre should contact ODT Hub Operations to remove them from the waiting list. If the patient needs to be re-activated after 14 days then a new registration form will be required and their waiting time will restart from zero. Centres are responsible for informing ODT Hub Operations when a patient is to be reactivated or removed.

### *7.1. Adult Donor Lungs*

Adult donor lungs are offered to all patients in the ULAS Paediatric and Small Adult patient categories before being offered to patients in the ULAS Adult patient category (Figure 1). Patients in the Small Adult patient category rank alongside those in the paediatric group. Urgent lung patients are ranked by 1) blood group and 2) length of time spent waiting on the ULAS for this registration.

### *7.2. Paediatric Donor Lungs*

Paediatric donor lungs are offered to all patients in the ULAS Paediatric patient category before being offered to patients in the NULAS Paediatric patient category (Figure 2). The donor lungs are then offered to ULAS Small Adult patients followed by ULAS Adult patients, NULAS Small Adult patients and finally to NULAS Adult patients. Urgent lung patients are ranked by 1) blood group and 2) length of time spent waiting on the ULAS for this registration.

## 8. Non-Urgent Lung Allocation Scheme

The Non-Urgent Lung Allocation Scheme (NULAS) is available for patients in the Adult and Paediatric patient categories and the offering process differs depending on whether the donor is adult (Figure 1) or paediatric (Figure 2). This scheme utilises the Adult Lung Centre Rota and, for the paediatric donor sequence, the Paediatric Lung Centre Rota as described above. For paediatric donors, non-urgent paediatric patients come before super-urgent and urgent Adult patients and Small Adult patients.

## 9. Offering Process

During the offering process the centre should maintain contact with the Specialist Nurse for Organ Donation. If the donor is becoming increasingly unstable and continuing with the offering sequence is likely to jeopardise other solid organ retrieval, the Specialist Nurse for Organ Donation should discuss with the Regional Manager on call whether it would be appropriate to abort the offering sequence.

Hub Operations will offer organs to Super-Urgent, Urgent and Non-urgent patients in accordance with the agreed protocols set out in SOP5139 – Hub Operations Cardiothoracic Manual, the sequences described in this policy, and in line with POL228 Heart Allocation Policy (*http://www.odt.nhs.uk/transplantation/tools-policies-and-guidance/policies-and-guidance/)*.

When first receiving an offer of a donor organ, centres should consider all patients on their list and advise ODT Hub Operations of their decision; whether they would like to accept for the patient for whom the offer is being given, or for a different patient lower down in the offering sequence. Centres should also consider any combined heart-lung recipients (urgent or non-urgent) and inform ODT Hub Operations if the donor is suitable for any such patient. If declining the offer, the reason for decline must be reported to ODT Hub Operations for auditing purposes.

Super-urgent/urgent named patient offers are usually made sequentially while non-urgent offers are made via a Group Offer. At all times the order of patients in the sequence will be honoured and an organ will only be allocated to a patient lower in the sequence if the organ has been declined for all patients above them. If at Group Offer stage, a centre would like to accept the organ for a super-urgent or urgent patient that did not appear in the matching run (for example, due to the size restrictions in place for that patient), the organ will be allocated to the super-urgent/urgent patient over a non-urgent patient.

Offering times:

- Named-patient offers 45 minutes
- Group offers – Heart or Lung 45 minutes
- Heart Lung Block group offer 60 Minutes
- Fast Track offer 45 minutes

A centre must only state that they wish to accept if, following full centre discussion, they have identified a specific patient who is suitable for the organ. Once a centre has been identified as the highest ranked accepting centre, additional time to re-consider the offer will not usually be granted so as to minimise delays to the donation process.

If the heart or lung(s) are eventually declined on inspection the organs may be fast-tracked as per Section 13. A centre wishing to accept an organ will retain its place on the lung allocation sequence while a decision is pending. If a centre chooses to decline the offer of an organ, it will retain its place in the centre rota.

## 10. Acceptance of One Lung in a Bilateral Lung Offer

- Donor lungs are usually accepted as a pair. However, there are some recipients who are listed for a single lung transplant.
- If a centre only accepts one donor lung when a pair of lungs is being offered with the intention of doing a single lung transplant, they **MUST** specify which side is being accepted. This is to allow the remaining donor lung to be allocated on to recipients at other centres with certainty of which lung is being offered on.
- It is unacceptable to leave the choice of the lung being accepted to the time of assessment by the retrieval team.
- If a centre does not specify which single lung is being accepted within the offering timeframe, the bilateral donor lungs will be automatically offered to the next centre in the allocation sequence.

## 11. Back-up Offering

Guidance on requesting a back-up offer for an accepted organ, where a centre may have concerns about going ahead with the transplant, are provided in **INF1606:** Cardiothoracic – Logistic Back-up Offering (https://www.odt.nhs.uk/transplantation/tools-policies-and-guidance/policies-and-guidance/).

## 12. Organs from Deceased Donors in Gibraltar

Organs from deceased donors in Gibraltar will be facilitated using the same donor characterisation process as a UK donor and all information can be viewed on EOS. Due to the logistical issues encountered with a flight time of 3 hours, these organs will be offered simultaneously to every centre and centres will have 45 minutes to respond by telephone to Hub Operations if they wish to accept. After 45 minutes, if more than one centre wishes to accept, the organ will be allocated according to the offering sequence.

## 13. Fast Track Offer Scheme

The Fast Track Offer Scheme is initiated in two scenarios:

1) When lungs are available at short notice from a UK donor, i.e.:
    - aortic cross-clamp (DBD donors) or withdrawal of treatment (DCD donors) is expected within 90 minutes of the referral to NHSBT, or
    - lung(s) have already been removed or are in the process of removal.

2) When lungs are available from Europe.

The scheme operates as follows:

- Offers of lungs meeting the Fast Track offer scheme criteria will be made to all centres simultaneously.
- Centres must respond to a Fast Track offer to Hub Operations within 45 minutes of the offer if they wish to accept. Hub Operations will not follow-up those centres that do not respond within this time. Centres not responding will be deemed to have declined the offer.
- After 45 minutes, if more than one centre wishes to accept, the lungs will be allocated according to the offering sequence, taking into account the urgency of the potential recipients.
- Group 1 patients will be allocated organs before Group 2 patients. Centres accepting for Group 2 patients must wait until the 45 minutes have lapsed to ensure no centre is accepting for a Group 1 patient.

## 14. Multi-Organ Allocation

### *14.1. Heart-Lung Block Allocation*

Heart-lung block allocation is described in **POL228**: Heart Allocation Policy (https://www.odt.nhs.uk/transplantation/tools-policies-and-guidance/policies-and-guidance/).

### *14.2. Lung-Liver Allocation*

#### *14.2.1. Non-Urgent Lung and Liver Transplant*

If a patient is registered on the Non-Urgent Lung Allocation Scheme and also requires a liver, the donor lungs will be allocated after all super-urgent and urgent patients but before all other non-urgent patients. This only applies to DBD adult donors; if a centre wishes to accept the lung(s) and liver from a DCD donor or paediatric donor, then this should be requested at time of centre offer and may require centre-centre discussion if the liver has already been placed. The order of patients in this tier will follow the Liver Allocation Sequence, i.e. by liver waiting time, and the donor liver will be allocated before all elective liver only patients but after all super-urgent liver patients, hepatoblastoma patients and intestinal failure patients (see **POL196**: Liver Allocation Policy https://www.odt.nhs.uk/transplantation/tools-policies-and-guidance/policies-and-guidance/).

#### *14.2.2. Urgent Lung and Liver Transplant*

If a patient is registered on the Urgent Lung Allocation Scheme and also requires a liver, the donor lungs will be allocated according to the order of patients in the ULAS. The donor liver will be allocated to such patients before all elective liver only patients but after all super-urgent liver patients, hepatoblastoma patients and intestinal failure patients, however the order will follow the position of patients in the urgent lung scheme as opposed to the liver sequence.

### *14.3. Combined Lung and Kidney*

#### *14.3.1. Non-Urgent Lung and Kidney Transplant*

If a patient is registered on the NULAS and also requires a kidney, the donor lungs will be allocated via the NULAS and the centre will request the kidney when responding to the centre offer. The availability of the donor kidney will be subject to any Tier A kidney patients (see **POL186**: Kidney Allocation Policy https://www.odt.nhs.uk/transplantation/tools-policies-and-guidance/policies-and-guidance/).

#### *14.3.2. Urgent Lung and Kidney Transplant*

If a patient is registered on the ULAS and also requires a kidney, the donor lungs will be allocated via the ULAS and the centre will request the kidney when responding to the patient offer. The availability of the donor kidney will be subject to any Tier A kidney patients.

## 15. Blood-borne Positive Donor Virology Scheme

The positive donor virology scheme is initiated when NHSBT is notified that a donor has an initial positive result for any of the markers listed below:

- Hepatitis B surface antigen (**not Hepatitis B** core antibody positive alone, with negative HBsAG)
- Hepatitis C antibody
- HIV 1 and 2 antibody
- HTLV 1 and 2 antibody

The scheme operates as follows:

- Offers of lungs meeting the positive donor virology scheme criteria will be made to all centres simultaneously that have confirmed they wish to be included in the scheme.
- Centres must respond to a positive donor virology offer Hub Operations within 45 minutes of the offer if they wish to accept. Hub Operations will not follow-up those centres that do not respond within this time. Centres not responding will be deemed to have declined the offer.
- After 45 minutes, if more than one centre wishes to accept, the lungs will be allocated according to the offering sequence, taking into account the urgency of the potential recipients.

## 16. Super-Urgent Liver Pathway

Recipients listed for super-urgent liver transplants are at risk of rapid and fatal deterioration during the time between listing and transplantation. The deterioration may occur over hours meaning that the recipient may become untransplantable. To expediate the offering of cardiothoracic organs when offered from the same donor, if a liver is accepted for a super-urgent recipient, all cardiothoracic organ offering will be made via group offer in accordance with the allocation sequence described herein. Lung only group offers will be given 45 minutes and heart-lung block group offers will be given 60 minutes.

## 17. Acceptance of Allocated Organs

It is the responsibility of the recipient surgeon to decide whether to accept an organ and this decision will depend on both donor and recipient factors. Organs from all donors will carry some degree of risk and the risks associated with transplantation must be balanced against the benefits of transplantation and the risks of awaiting a further offer. The recipient is entitled to decline organs from donors with particular characteristics and these wishes should be respected.

## APPENDIX 1

**Suggested Criteria for Non-Retrieval of Lungs**

A decision not to proceed with offering would be based on a documented $PaO_2$ <25kPa (187 mmHg) on $FiO_2$ 1.0 and PEEP 8cm$H_2O$ provided that:

- Endotracheal tube malposition had been excluded by chest x-ray (CXR) or bronchoscopy.
- Rigorous attempts had been made to recruit atelectatic segments by ventilator adjustment and physiotherapy.
- There are bilateral pathological changes on CXR.
- A clear cause for hypoxaemia has been established e.g. bilateral pulmonary contusion or other trauma, documented aspiration, CXR evidence of major pulmonary consolidation.
- In the presence of PaO2 <25kPa on FiO2 1.0 and PEEP 8cm.$H_2O$ and unilateral CXR changes only, the possibility of single lung transplantation should be considered (pulmonary venous sampling during attempted organ retrieval is recommended).

## APPENDIX 2

**Suggested Donor Lung Acceptance Criteria**

***These are at the discretion of the recipient centre and should be in line with previously documented patient wishes***

- Age up to 70 years for DBDs and 65 years for DCDs, extended to 75 for both if donor did not smoke for 10 years or more or was a lifetime non-smoker.
- Smoking history should not be the sole reason for refusal of a well-functioning organ. Acceptable up to 30 pack years (i.e. 1 pack per day for 30 years). If greater than this, other factors should be considered in conjunction with smoking history as reasons for refusal.
- No or minimal chest trauma.
  - Pneumothorax and/or a chest drain are not a contraindication.
  - No previous chest surgery on the retrieval side.
- Ventilated less than 10 days.
  - Tracheostomies are acceptable.
- Normal CXR appearance reported on retrieval day.
  - Normal cardiac silhouette, normal lung fields.
  - Normal cardiothoracic ratio (i.e. less than 50% on standard CXR).
  - Borderline gases with a unilateral abnormality on CXR may mask a usable contralateral lung.
- No evidence of respiratory infection as demonstrated on CXR or the presence of purulent sputum and confirmed pathogens.
  - Purulent secretions do not necessarily rule out lung donation. Multiple organisms on gram stain may indicate normal flora and are unlikely to lead to infection. No donor should be rejected based on history of purulent sputum without bronchoscopic evidence of infection (i.e. infected mucosa).
  - Heavy fungal contamination of the bronchial tree may exclude donation. Candida infection should be treated with an azole.
- No systemic sepsis (i.e. white cell count >20,000/mL or pyrexia. 38 C of unknown origin)
- Acceptable arterial blood gases (ABG):
  - On $FiO_2$ 100%, $PaO_2 \geq 35$ kPa and on
  - $FiO_2$ of 40%, $PaO_2 \geq 14$ kPa
  - $PO_2$ (kPa) should preferably be 35 x $FiO_2$
  - $PO_2$ of 25 x $FiO_2$ may be considered at the discretion of the senior implanting surgeon.
- Normal ventilatory parameters with normal compliance.
  - The addition of 8 $cmH_2O$ of positive end-expiratory pressure (PEEP) is recommended.
- Mild asthma is acceptable (but may be transmitted).
- Current pulmonary oedema if associated with CXR changes and borderline ABG excludes donation. May consider if treated and resolved. Fluid overload should be avoided.
- No evidence of aspiration. The presence of a positive history, poor gases and abnormal CXR and bronchoscopic findings suggesting aspiration will preclude donation. In cases of history suggesting inhalation, donors should have abnormal bronchoscopy before being turned down.
- CMV mismatches are acceptable unless specified in high risk recipients
- Carbon monoxide poisoning is acceptable with caution as long as there is no smoke inhalation.

**Donor heart-lung acceptance criteria**

- In addition to the above, heart acceptance criteria should apply. These are covered within **POL228**: Heart Transplantation: Organ Allocation. (http://www.odt.nhs.uk/transplantation/tools-policies-and-guidance/policies-and-guidance/)