1. Principles of Lung TWL matching in OrganMatch

In OrganMatch, recipients listed on the Lung transplant waiting list (TWL) are matched with deceased organ donors using multi-tiered matching algorithm.

There is one parent algorithm:

- Lung (LAv1)

Matching using the above parent algorithm triggers a series of functions and child algorithms.

The first version of the Lung Matching Algorithm (LAv1) is effective from December 2022.

- Enhance the current process for selection of recipients to be crossmatched with deceased organ donors and to facilitate a more efficient process for issuing VXM results
- Provide a list of potential recipients from OrganMatch. Previously, this was performed manually at a unit level.
- Potential Recipients with UA to the donor HLA mismatches will be excluded
- Include the matching of Nationally Urgent patients (High acuity and Recipient <16 years old) to be matched across all jurisdictions
- The matching algorithm will be run by the OM laboratory processing the donor once the lung has been accepted as suitable for transplant and the donor is ready to be matched.
- Prioritise Matching for Paediatric donors (=< 16 years old) to paediatric recipients (=<16 years old) and listed for transplant at The Alfred Hospital – Lung Unit

Scoring is used to order the list, and not for ranking or allocation purposes.

1.1 High-level compatibility check

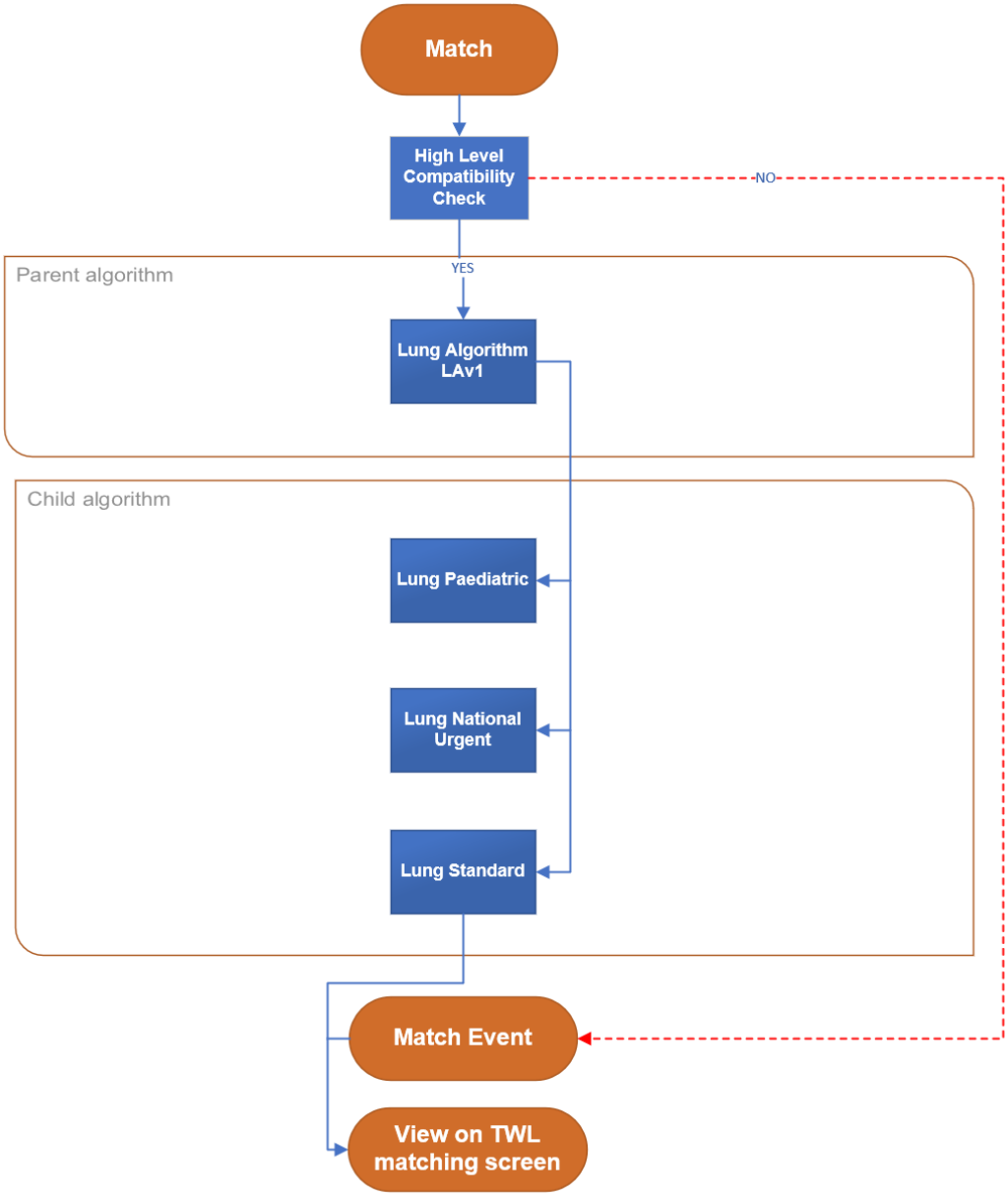
The first step in matching is the high-level compatibility check, which determines if recipients will progress to being matched in the next stage of the algorithm.

Check	Process	!	×	✓
No Unacceptable Antigens (UA) identified	Compares donor HLA with recipient UA. Includes all HLA loci.	Potential UA for the donor are listed Will proceed to matching	UA and donor HLA match. Does not proceed to matching.	Recipient and donor compatible. Proceeds to matching.
Valid ABO for program	Checks ABO compatibility.	N/A	Does not proceed to matching.	Recipient and donor compatible. Proceeds to matching.
Acceptable height range	Compares donor height to the Acceptable height range for recipient	N/A	Does not proceed to matching.	Recipient and donor compatible. Proceeds to matching.

If a recipient passes the high level compatibility check, they progress to matching, depending on which parent algorithm is selected they proceed to matching.

2. Lung Algorithm (LAv1)

The Lung algorithm consists of three child algorithms. The child algorithms are executed in a set order.



2.1 Lung Paediatric

If the donor is less than 16 years old match this child algorithm with include only recipients 16 years or less, listed for transplant at The Alfred – Lung unit transplant centre.

Algorithm name	Check	Process	!	×	✓
Lung Paediatric	**Valid ABO for Lung** (See Section 3)	Checks ABO compatibility.	N/A	Does not proceed to matching.	Recipient and donor compatible. Proceeds to matching.

2.1.1 Lung Paediatric algorithm score

The base score is calculated for each recipient that proceeds to matching

Level	Description	Base Score
	All patients	5,000,000
	Paediatric patients with transplant unit = Alfred Lung Unit	+ 5,000,000

2.2 National Urgent

A recipient will be included if:

- Not already matched in the Lung Paediatric and has a National Urgent flag (High acuity and Recipient <16 years old

Algorithm name	Check	Process	!	×	✓
Lung National Urgent	Valid National Flag	Check National Urgent flag with High acuity and Recipient <16 years old	N/A	Does not proceed to matching.	Recipient and donor compatible. Proceeds to matching.
Lung National Urgent	Valid ABO for National Priority	Checks ABO compatibility.	N/A	Does not proceed to matching.	Recipient and donor compatible. Proceeds to matching.

2.2.1 National Urgent Score

The base score is calculated for each matched recipient.

Level	Description	Score
National Urgent	Base Score	5,000,000
National Urgent	National Priority Flag	Add 2,000,000

2.3 Standard Algorithm

A recipient will be included

- their ABO type is compatible with donor as determined by the ABO Type Selection Rules (Section 4).

The donor OM lab will determine which Unit the organ will be matched with first, subsequent matches will occur in OrganMatch but offered as per the current Rotation rules (Process not in OrganMatch currently).

Algorithm	Donor OM Lab State*	Recipient transplant unit
Standard	NSW (includes ACT)	St Vincents, Sydney – Lung Unit
	VIC (includes TAS)	The Alfred Hospital Lung Unit
	SA (includes NT)	**
	QLD	Prince Charles Hospital Lung Unit
	WA	Fiona Stanley Hospital lung unit

*OrganMatch Lab refers to the Tissue Typing lab that performs the donor testing

** SA OM lab to match as per directed by the Home state / rotation

All patients will be included in the matching

Algorithm name	Check	Process	!	×	✓
Lung Standard	Valid ABO for Lung (See Section 3)	Checks ABO compatibility.	N/A	Does not proceed to matching.	Recipient and donor compatible. Proceeds to matching.

2.3.1 Lung Standard Score

The base score is calculated for each recipient that proceeds to matching

Level	Description	Base Score
	All patients	5,000,000
	Home state	+ 1,000,000

3. ABO compatibility rules

The following table show the compatible ABO groups. Additional points are added to the score for compatibility. This assists with the final sort order.

Algorithm	Donor ABO type	Patient ABO type	Score
Lung	A	A	100,000
	A	AB	70,000
	B	B	100,000
	B	AB	70,000
	AB	AB	100,000
	O	O	100,000
	O	A	70,000
	O	B	40,000
	O	AB	10,000

4. Organ Offer List Order

Sorting will be by score descending –

Calculate and the following are additions to the scores above:

- Add score by blood group (see scores in table in point 5)
- Calculate score by Recipients' Acceptable height From: (300 – Acceptable Height From (cm)) x 100

Examples:

300 – 1 (acceptable height from) x 100 = 29,900 score

300-150 (acceptable height from) x100 = 15,000 score

300 – 170 (acceptable height from) x 100 = 13,000 score

300 – 299 (acceptable height from) x 100 = 10,000 score

5. Recipient Readiness Criteria to be matched

Recipients must be ready and active to be able to be matched via an algorithm in OrganMatch.

The readiness criteria must be met in order to be matched in the algorithm.

The current readiness criteria for patients listed for Lung TWL is as follows, with proposed changes listed.

Recipient requirement	Proposed Changes
HLA Typing	HLA A - 1 field HLA B - 1 field HLA C – 1 field HLA DRB1 – 1 field HLA DQB1 – 1 field HLA DQA1 – 1 field HLA DPB1 – 1 field HLA DPA1 – 1 field
Location	OM Lab Transplant Hospital
Samples	ABO final and ABO confirmed
Luminex Antibody Screen • SAG1 tested • SAG2 tested	 Yes within 100 days Yes within 100 days
Unacceptable antigens List authorised	Yes
Lung Specific Height and weight Acceptable height range	Yes

Abbreviations

Abbreviation	Definition
LAv1	Lung Matching Algorithms version 1
OM	OrganMatch
TWL	Transplant waiting list

Definitions

N/A

Change history

Version number	Effective date	Summary of change
1	1/9/2022	First version

Electronic signature

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