1. Principles of Heart TWL matching in OrganMatch

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

There is one parent algorithm:

- Heart Algorithm (HAv1)

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

The first version of the Heart Matching Algorithm (HAv1) is effective from February 2023.

- 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.
- Prioritise Matching for Paediatric donors (=< 16 yo and <50kg) to paediatric recipients (=<16 years old) and Listed for transplant at the Royal Children's Melbourne – Heart Unit.
- The matching algorithm will be run by the OM laboratory processing the donor once the heart has been accepted as suitable for transplant and the donor is ready to be matched.

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.

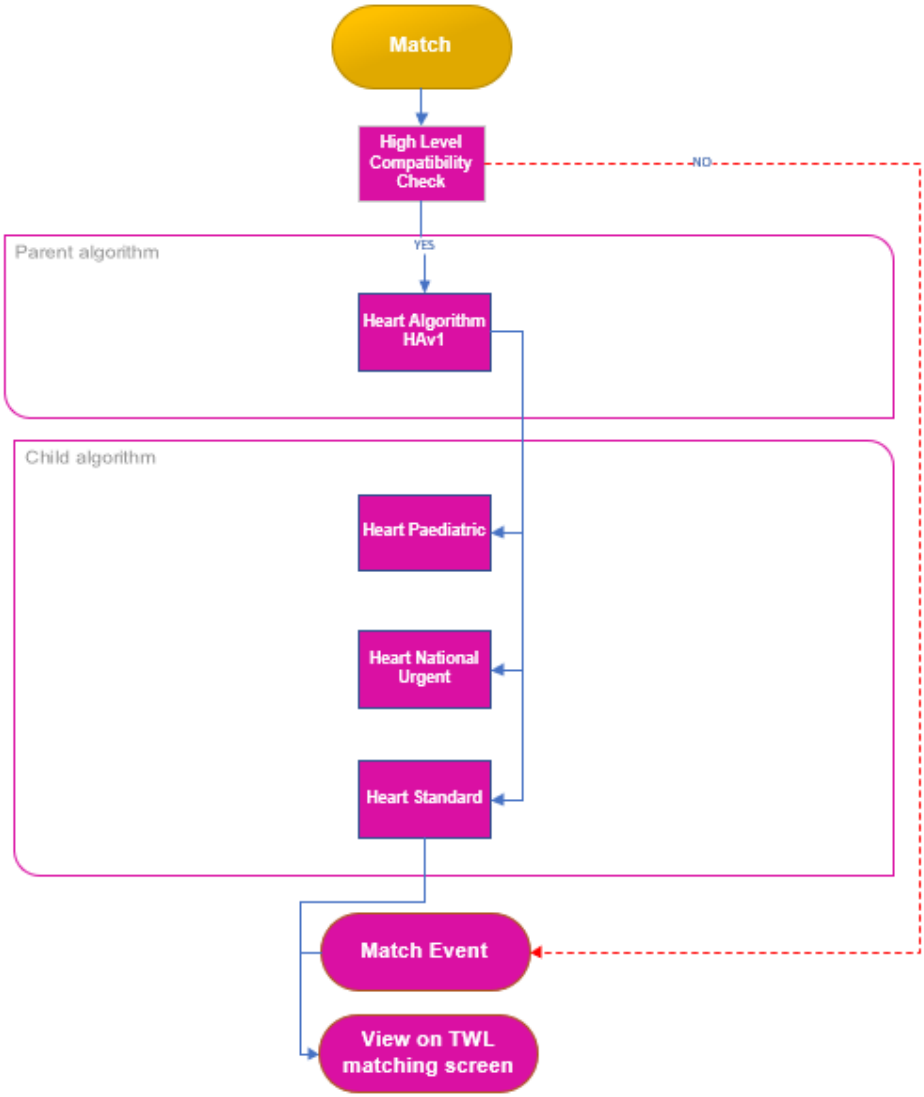
Check	Process	!	×	✓
Predictive Heart mass Ratio (PHM)	Compares predictive heart mass ratio	N/A	Does not proceed to matching.	HPM ratio falls between specified % range eg : +/- 30% as specified for each state# Proceeds to matching.

Each state can specify a % range – this will be managed in a reference table so is easily changed on request.

If a recipient passes the high-level compatibility check, they progress to matching.

2. Heart Algorithm (HAv1)

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



2.1 Heart Paediatric

If the donor is less than 16 yo and <50kg match only with recipients aged <16 years listed for transplant at The Royal Childrens – Melbourne heart unit transplant centre, the following will occur:

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

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

2.1.1 Heart 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 = Royal Childrens Melbourne –Heart Unit	+ 5,000,000

2.2 National Urgent

A recipient will be included if:

- Not already matched in the Heart Paediatric and has a National Urgent flag.

Algorithm name	Check	Process	!	×	✓
Heart Urgent	**Valid National Flag**	Check Urgent flag with	N/A	Does not proceed to matching.	Recipient and donor compatible. Proceeds to matching.
Heart Urgent	**Valid ABO for National Priority** (see Section 4)	Checks ABO compatibility.	N/A	Does not proceed to matching.	Recipient and donor compatible. Proceeds to matching.

Note: Heart Urgent listing process not currently in OrganMatch

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 – Heart Unit
	VIC (includes TAS)	The Alfred Hospital Heart Unit Royal Children's Hospital, Melbourne Heart Unit
	SA (includes NT)	**
	QLD	Prince Charles Hospital Heart Unit
	WA	Fiona Stanley Hospital Heart 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	!	×	✓
Heart Standard	Valid ABO for Heart (See Section 3)	Checks ABO compatibility.	N/A	Does not proceed to matching.	Recipient and donor compatible. Proceeds to matching.

2.3.1 Heart 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
Heart	A	A	100,000
	A	AB	70,000
	B	B	100,000

Algorithm	Donor ABO type	Patient ABO type	Score
	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 –

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 Heart 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

Heart Specific Height and weight	Yes

Abbreviations

Abbreviation	Definition
HAv1	Heart Matching Algorithms version 1
OM	OrganMatch
TWL	Transplant waiting list

Definitions

N/A

Change history

Version number	Effective date	Summary of change
1	13/2/2023	First version

Electronic signature

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