INTRODUCTION

Patients and donors must be enrolled in the OrganMatch in the Organ program, Kidney and Kidney Paired donation (KPD) pathway to be matched.

OrganMatch enrolments may be created from the Laboratory portal or the Transplantation Portal via the registration process. Using the transplantation portal, additional clinical information can be entered so this is this is the preferred option. Recipients and donors must be enrolled in the Kidney Program – KPD pathway to be included for KPD matching. See OM-027 for Registration in KPD.

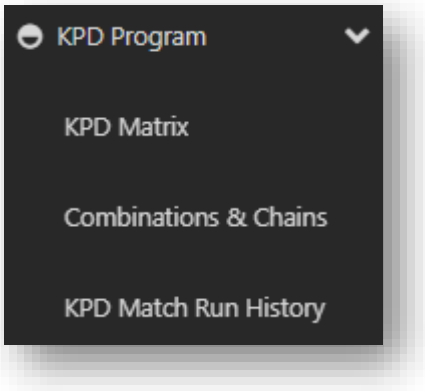
KPD matching occurs in the OrganMatch Laboratory Portal.

PURPOSE

This document describes the process of KPD matching in OrganMatch.

KPD Program on the navigation pane contains three sections:

- KPD Matrix
- Combinations & Chains
- KPD Match Run History



1. KPD MATRIX

The KPD matrix displays recipients and donors enrolled in the KPD transplant pathway. The donors are listed down the page and recipients along the top of the page. Compatibility assessments (Y), or no (X) based on the criteria described in **Error! Bookmark not defined.**.3.

The matrix is live and reflects any changes that affect the compatibility of a matched pair immediately. It includes every person who is enrolled in KPD regardless of their readiness, hold or availability status.

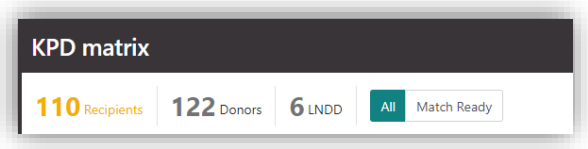
The user can click on the cell at the intersection (with the exception of a registered pair) of any pair, and access a match event to add notes, review assessment, block pair from future matching etc.

1.1 VIEW THE MATRIX

From the navigation pane, click KPD Program, and then click KPD Matrix.
The KPD matrix will load with the current data.

ALL MATCHES

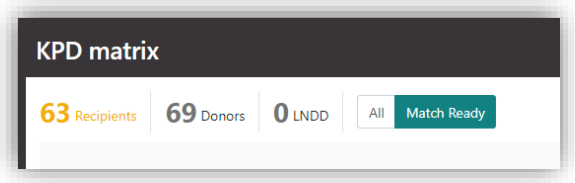
Once a patient and donor is registered on the Kidney -KPD program, the patient and donor will appear in the KPD Matrix. This view will display all patients and donors, irrespective of status or readiness.



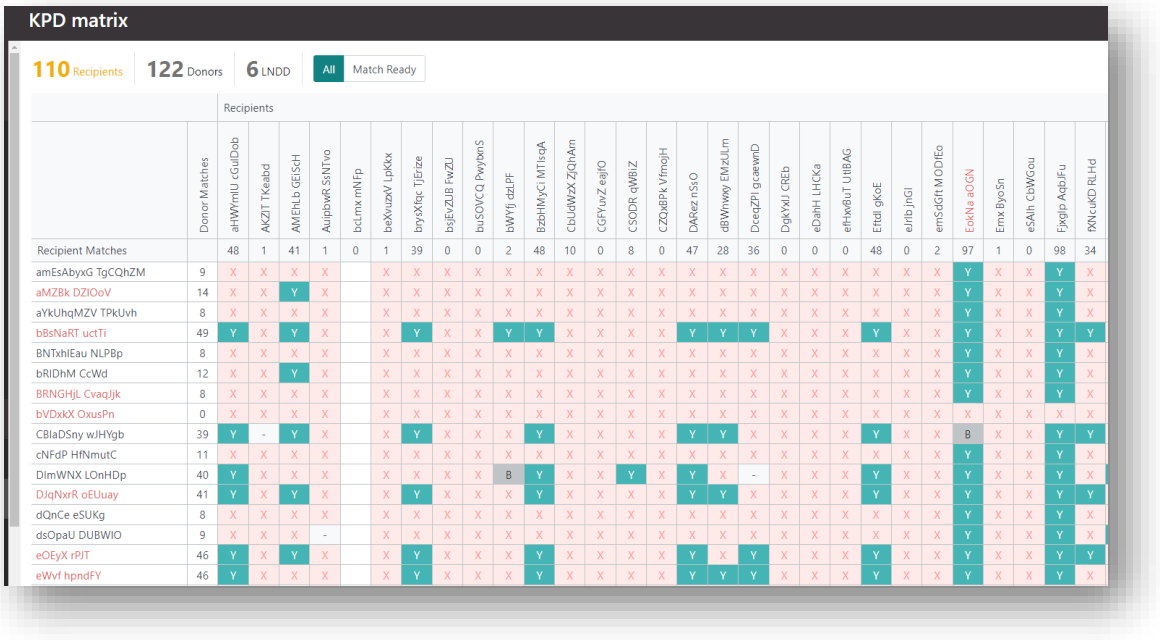
MATCH READY ONLY

The Enrolment status should be active for both the patient and donor, when the patient is ready to be matched. When the Readiness criteria is met and the patient and donor are active, the pair are “Match ready”.

To view the matrix with only match ready recipients and donors, click the **Match Ready** button.



1.2 KPD MATRIX AND KEY

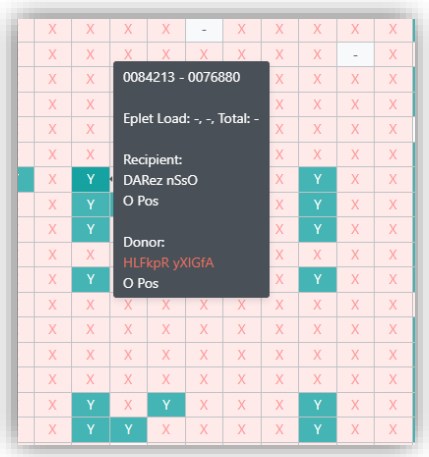


The KPD matrix is colour-coded to assist with viewing possible matches.

KPD Matrix Key	
Y	The match is compatible
X	The match is incompatible
B	The eligible recipient/donor pair is blocked
-	This is a Registered Pair
Blank	The status of the Matched Pair cannot be calculated as one (or both) of the match pair is not ready
Red Patient and donor names	The Name in red indicates that the person's co-registered donor or recipient has 0 matches

Find a patient in matrix	Press Ctrl F and enter name. Name will be highlighted in matrix

Hover over the matrix to display more information on the patient and donor



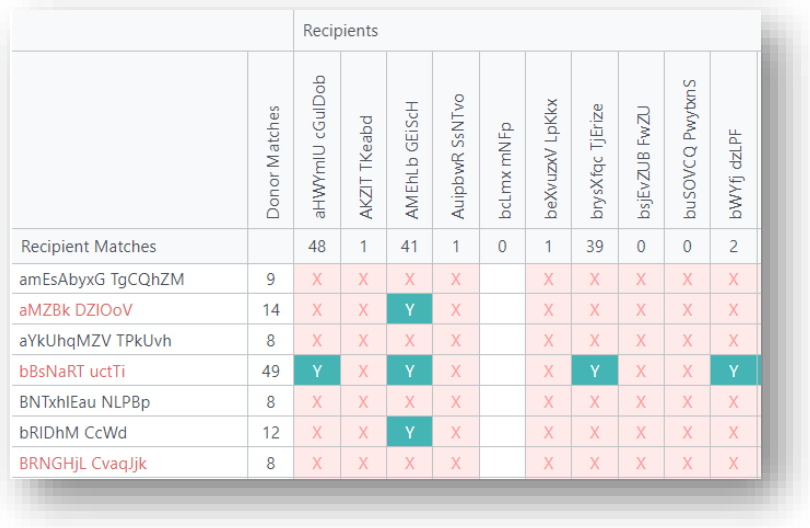
1.3 MATCHABLE PAIR COMPATIBILITY ASSESSMENTS

Each eligible recipient/donor pair is assigned a compatibility of yes (Y), or no (X) based on an assessment of the:

- donor and recipient's blood group compatibility (see Appendix 1 – ABO compatibility table)
- donor's HLA typing profile and the recipient's unacceptable antigen list
- donor's extended acceptance criteria, and which criteria the recipient is willing to accept

Donor and recipient's HLA typing is required , however does not impact the compatibility assessment in the matrix.

The following table shows the steps OrganMatch runs through to determine the compatibility of each eligible recipient/donor pair. The result of the compatibility assessment displays in the KPD matrix.



		Recipients									
	Donor Matches	aHWYmIU cGulDob	AKZIT TKeabd	AMEhLb GEiScH	AuipbwR SsNTvo	bcLmx mNFp	beXvuzxV LpKkx	brysXfqc TjErize	bsjEvZUB FwZU	buSOVCQ PwybxnS	bWYfj dzLPF
Recipient Matches		48	1	41	1	0	1	39	0	0	2
amEsAbyxG TgCQhZM	9	X	X	X	X		X	X	X	X	X
aMZBk DZIOoV	14	X	X	Y	X		X	X	X	X	X
aYkUhqMZV TPkUvh	8	X	X	X	X		X	X	X	X	X
bBsNaRT uctTi	49	Y	X	Y	X		X	Y	X	X	Y
BNTxhIEau NLPBp	8	X	X	X	X		X	X	X	X	X
bRIDhM CcWd	12	X	X	Y	X		X	X	X	X	X
BRNGHjL CvaqJjk	8	X	X	X	X		X	X	X	X	X

Table 1: Compatibility Steps

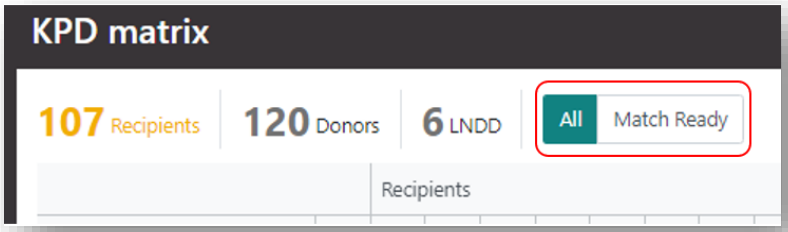
Step	KPD Eligible Recipient/Donor Pair Compatibility Assessment Steps	

1.	ABO Blood group	Compare donor and recipient ABO:
		• If okay, then proceed to next check.
		• If NOT, check ABOi rules
		  • Is the recipient willing to accept ABOi?
		  • Is the ABO compatible as per the ABOi rules?
		• If the above conditions are not met, update assessment as Not Compatible in the KPD matrix

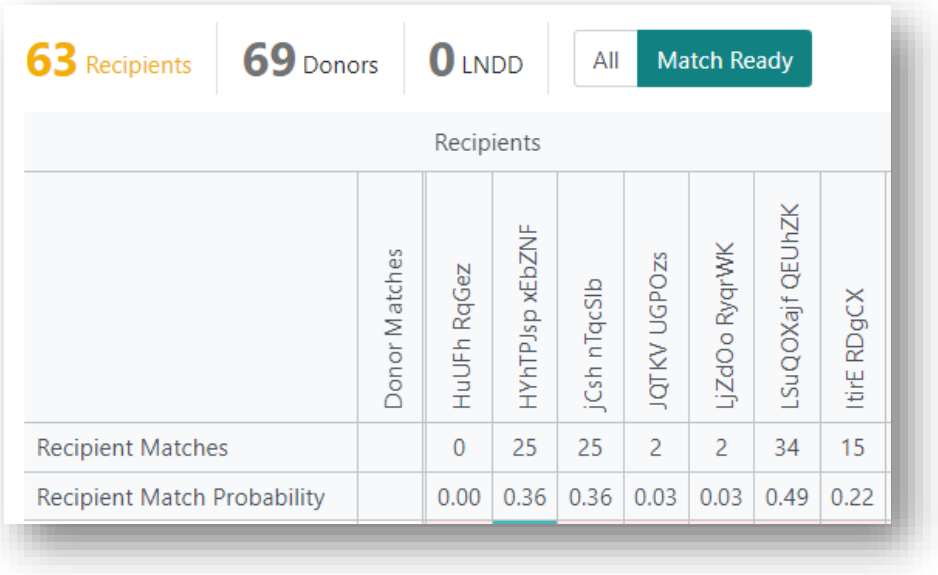
2.	Donor HLA and recipient UA	Compare donor HLA and recipient UA: • If no UA matches found, then proceed to the next check. • If an UA match is found, then update assessment to Not Compatible
3.	Compare the donor extended acceptance criteria with acceptance criteria selected by the recipient	Compare the donor extended acceptance criteria: • If the donor has extended acceptance criteria that the recipient won't accept, update the assessment as Not Compatible. •

1.4 RECIPIENT MATCH PROBABILITY

To view the recipient match probability score for each donor, click the Match Ready button.



The **Recipient Match Probability** displays below the **Recipient Matches** row.



The **Recipient Match Probability** is calculated as follows: Recipient match probability (RMP) = a / b, where,

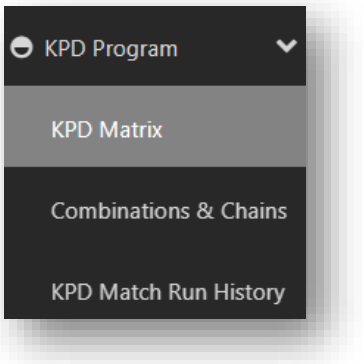
a = the number of donors in the pool who are ready, and not on hold, and who have a match event compatibility of 'Y' for the given recipient

b = total number of donors in the pool who are ready, and not on hold

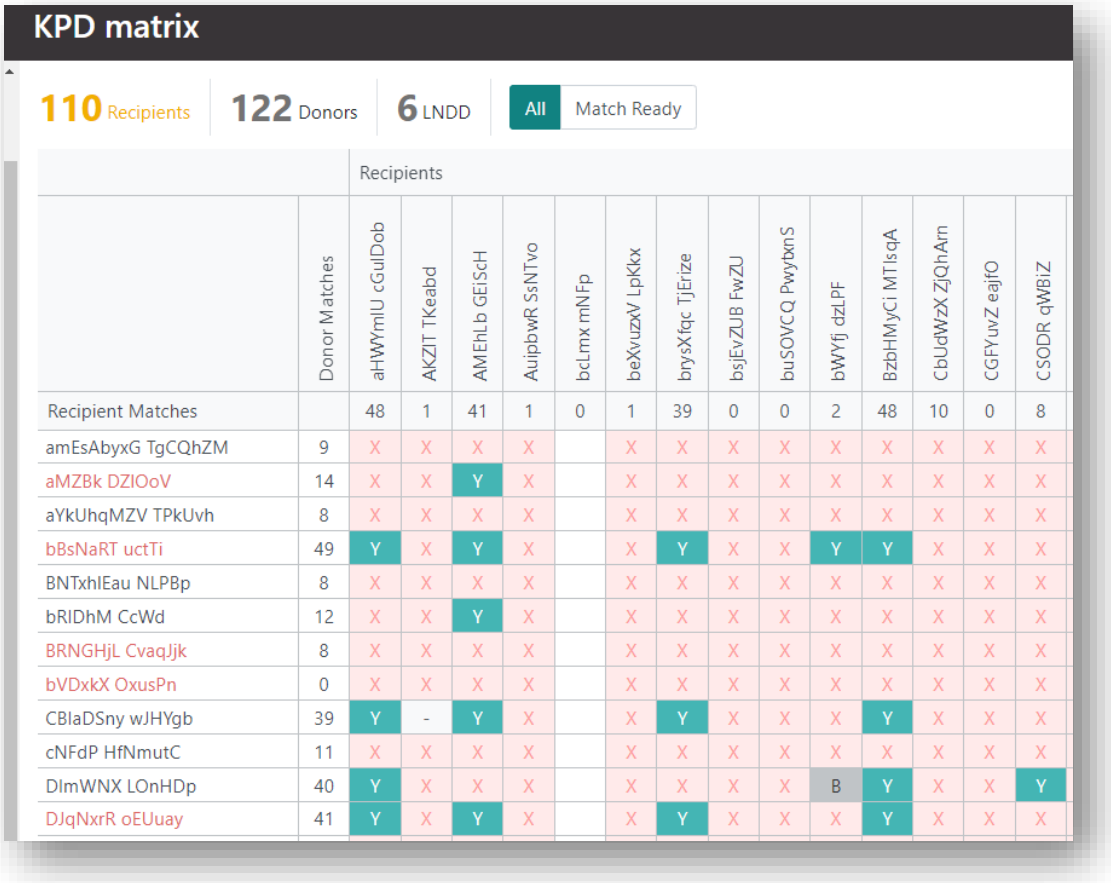
Example:

There are 13 donors and 12 recipients in the KPD pool who are ready, and not 'on hold'. The first recipient has 3 match events shown with a match event status of Y, so **a** = 3, **b** = 13 **a/b** = 3/13 = 0.23

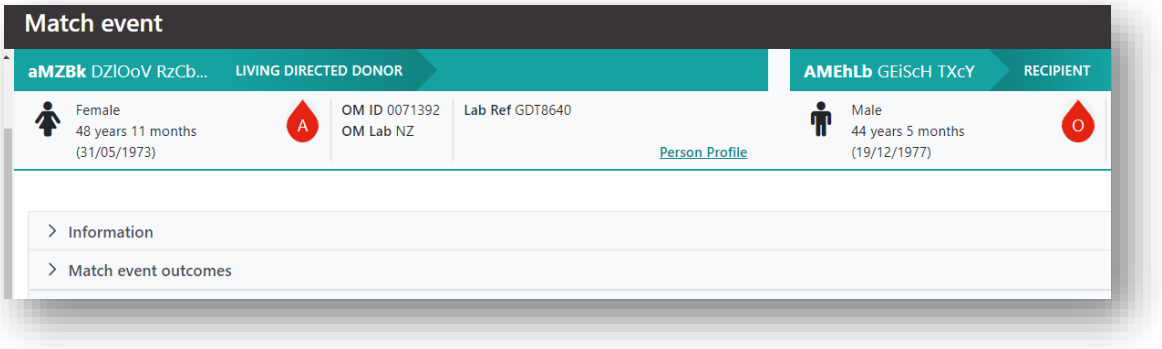
1.5 LOOK AT A MATCH EVENT



1. The KPD matrix is displayed



1. Click a cell at the intersection of a donor and recipient to view the match event for the eligible recipient/donor pair. Right click and open match event in a new tab to avoid the matrix requiring reloading when you return to it.



1.6 ABOUT KPD MATCH EVENTS

OrganMatch will automatically create a new match event when:

- A person (donor or recipient) is enrolled in the Kidney KPD pathway.
- The match profile of a person (donor or recipient) enrolled in the Kidney KPD pathway is updated

If a match event already exists then a new version of the match event is created. A match event is created for every eligible recipient/donor pair. The match history of a patient can be found in the Match History section for recipient and donor

1. From the **Person details** pane, click the **Match history** section.

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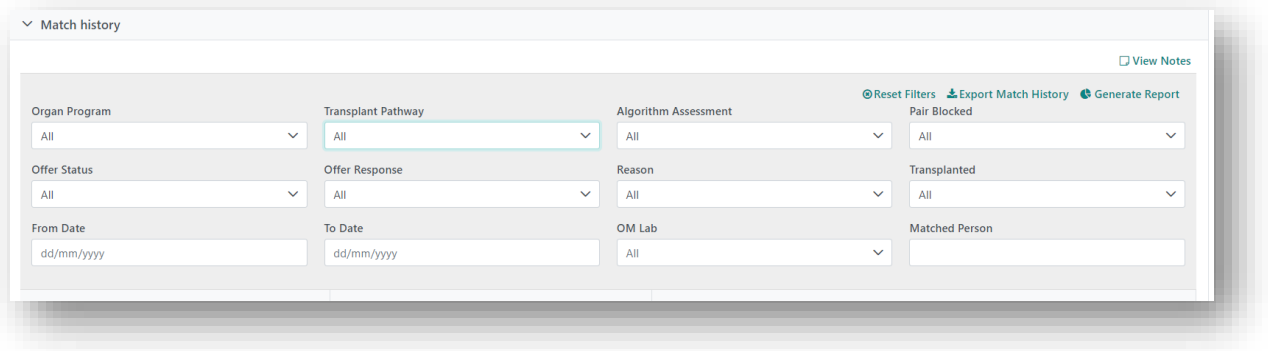
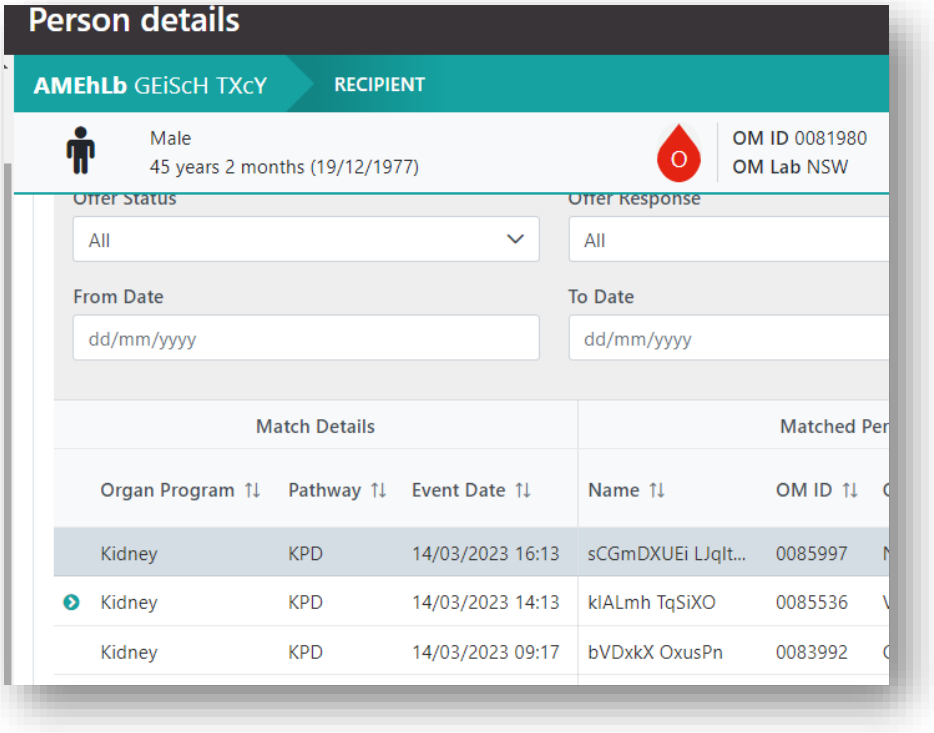
2. Filter the list of matched people by selecting values in the filter options fields.



3. Click the list item to view the match event of the matched person.



1.7 BLOCK AN AMP (ELIGIBLE RECIPIENT/DONOR PAIR)

Match Pairs can be blocked if required for the following reasons ;

- The age difference is not acceptable

- Location of patient and donor is logistically problematic
- The improvement in matching is not sufficiently better than their own donor , in the case of compatible pairs
- The match has been previously rejected by the transplant unit due to anatomical / clinical reasons.

It is possible to block an AMP (eligible recipient/donor pair).

From the **Match event** pane, click the **Match event outcomes** section. See **Look at a match event**

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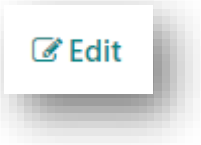
1. Click **Edit**.



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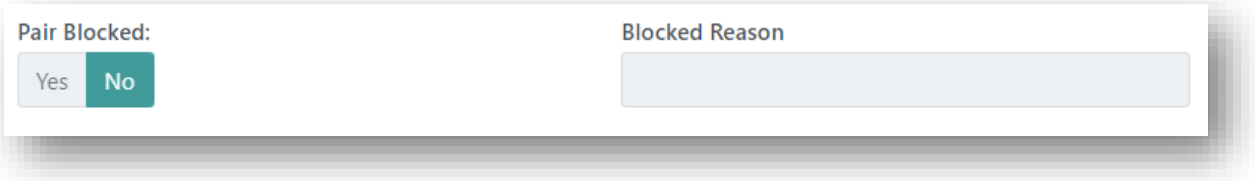
2. Click **Yes** to block the pair, or **No** to unblock a blocked pair.



You need to add a reason for blocking a pair. This is mandatory if you click **Yes**.

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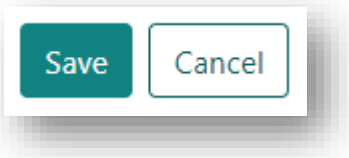
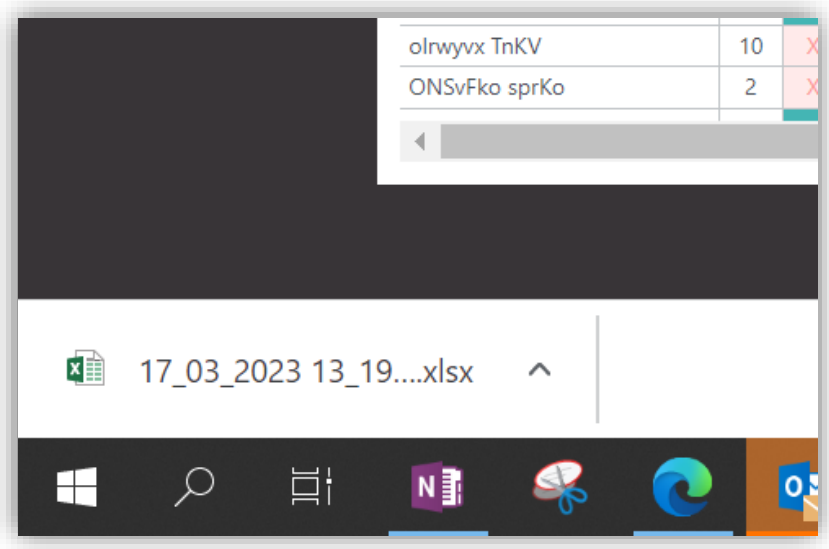
3. Click **Save** or **Cancel** to cancel the action.



1.8 EXPORTING THE MATRIX

1. Select KPD Matrix and in the right-hand corner export matrix is visible.

2. Click on **Export Matrix**
3. An excel file of the Matrix will be created. This is visible in the bottom left hand corner. The file can be opened or downloaded from your download documents.



2. COMBINATIONS AND CHAINS

2.1 CHAINS

When an RP is ready and active, they will be matched by OrganMatch to find compatible pairs (see 1.3 Matchable Pair Compatibility Assessments). If each person in the RP is either giving to (donor) or receiving from (recipient) other RPs to form MPs, a chain of MPs is formed by OrganMatch.

2.2 OPEN CHAINS

A chain can be 'open' which means that it begins with a Living Non Directed Donor (LNDD) giving to a recipient. A LNDD is a donor that is registered without a registered patient. When a chain is open, it means that the final chain will result in one donor who cannot give to any KPD recipient. We call this the “End of chain Donor”. Open chains always begin with an LNDD and end with the “End of chain donor”.

The end of chain donor will be manually enrolled in the TWL pathway and the kidney will be allocated using the TWL matching process where the donor state is seen as the state of the original LNDD, not the state of the end of chain donor.

Open chains can be very long and could have hundreds of pairs potentially. Normally though the number of pairs is limited to a number less than seven. Only one LNDD should be used in a chain.

An open chain will always have:

- No duplications of either a donor or recipient in the chain,
- Only one RP donor per recipient in the chain (recipients can have multiple registered donors, however only one donor can be used in a chain)
- Only one LNDD in the chain for open chains.

2.3 CLOSED CHAINS

Chains can also be closed. A closed chain means that there is no LNDD, and within the group of people included, each KPD recipient and (one of) their registered donors is included.

Generally closed chains are much shorter that open chains. A closed chain will always have:

- No duplications of either a donor or recipient in the chain,
- Only one RP donor per recipient in the chain (recipients can have multiple registered donors, however only one donor can be used in a chain),
- For every donor in the chain, a matched recipient from within the chain MPs.

2.4 COMBINATIONS

A combination is a group of unique chains. You can create combinations in OrganMatch. When this happens, OrganMatch generates a combination for you based on criteria you set and the people currently in the KPD matrix. It will include:

- All recipients who have a match compatibility of Yes and who are Active.
- All linked donors to those recipients (there can be multiple donors per recipient) who are ready and active.

2.5 RANKING COMBINATIONS

OrganMatch will rank the combinations using the following rules:

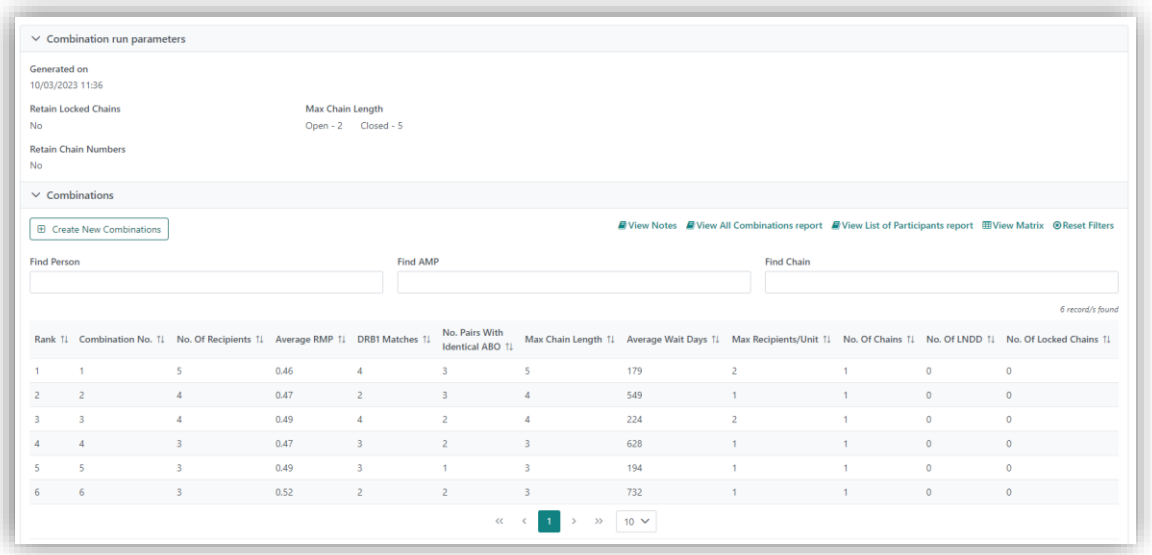
Combination Ranking	
Number of recipients in the combination	Highest number of recipients first
Average match probability of recipients	Lowest match probability first
Number of matched DRB1	Highest number of matches first
Number of identical blood groups	Highest number with identical blood groups first
Maximum chain length	Lowest chain length first
Average waiting time of recipients in the combination	Longest waiting time first

2.6 CREATE NEW COMBINATIONS AND CHAINS

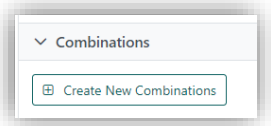
New combinations for people registered in the KPD pathway can be created at any time unless there is an existing published combination.

- When you generate new combinations, the previously generated combinations will be discarded.
- However, you have the options of:
- locking chains within a combination to ensure these are not lost, and
- you can opt to retain the chain numbers from previously generated combinations, if the same chain is produced in the new set of combinations.
- A match event is created for each time a recipient/donor pair is considered. The match events are saved, and can be looked in a person's match run history, even if a new set of combinations is created.
- Due to the number of chains and combinations that can be created , the system supports a maximum of 200 x 200 donor recipient pairs , 3 LNND's per run , and a maximum chain length of 7 open chains.
- Capping of created chains will be capped at 1 million .

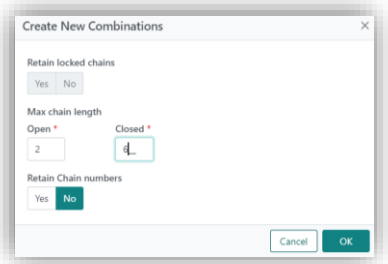
1. From the navigation pane, click **KPD Program**, and then click **Combinations and Chains**.



2. Click the **Create New Combinations** button in the **Combinations** section.



3. Select the runtime parameters.



You can set:

Retain locked chains – whether or not previously locked chains needed to be included in the new combinations. If this is set to **Yes**, the locked chains will be included in every combination. This must be set if required. If not set to **No**

Maximum chain length – the maximum chain length for open and closed chains. These parameters must be set. Closed chains don't have a Living Non-directed Donors (LNDD), whereas open chains do have a LNDD.

Retain Chain numbers – when combinations are regenerated, if a chain is produced which was also produced when the user created the previous set of combinations, it should be shown with the same chain number as it did in the previous run.

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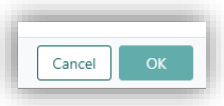
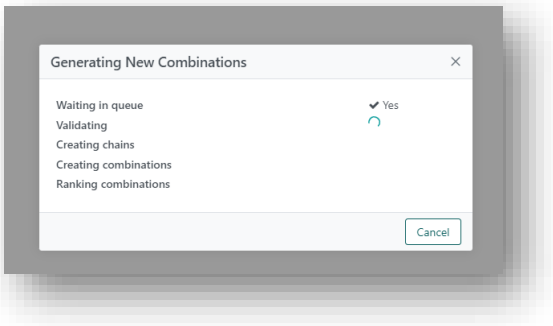
4. Click **OK** or **Cancel**.



OrganMatch displays progress as it regenerates the sets of combinations.



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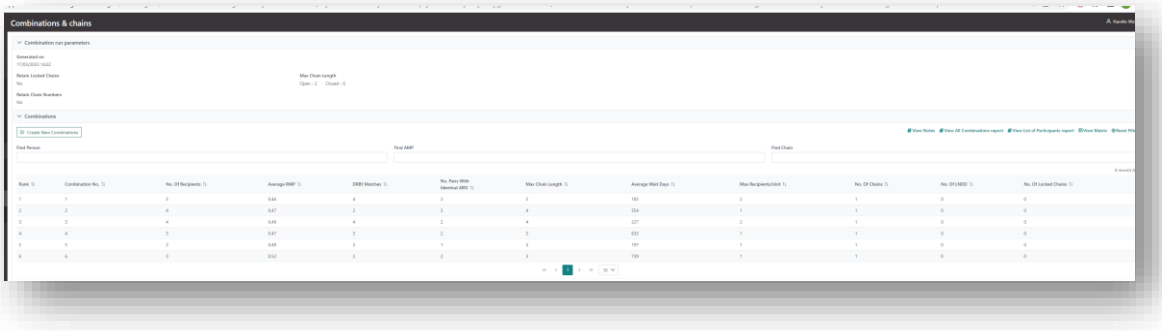
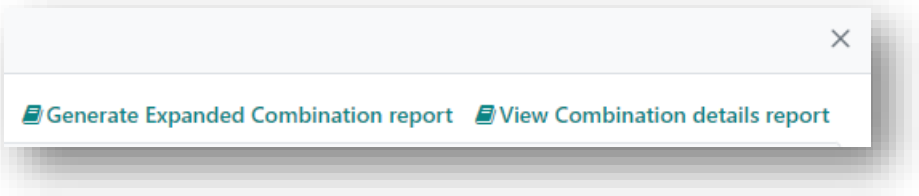
5. The latest set of combinations is displayed. The parameters you selected in step 3 are displayed, along with the time and date the set of combinations was generated.



6. To produce a report of then combination details, click the specific combination from the list, and then click **View Combination details report**.



Note : *If there are no locked chains, only single chains will be generated in the first pass at running Chains and Combinations . If a chain has been locked from this first run then subsequent runs will produce combinations of 2 or more chains which include that locked chain.*

Since the introduction of continuous matching the normal process is to identify any matches for Highly sensitised recipients on the matrix, then search for that match event via the " Find AMP" function in a chain from the chains produced in the Generating New Combinations " run, select the best possible chain that includes that match event and save that chain to KPD Match Run History. The pairs involved in the saved chain would be on hold due to KPD chain in both the KPD enrolment and a TWL enrolment if that exists. The process is then repeated until no more possible chains can be identified and saved.

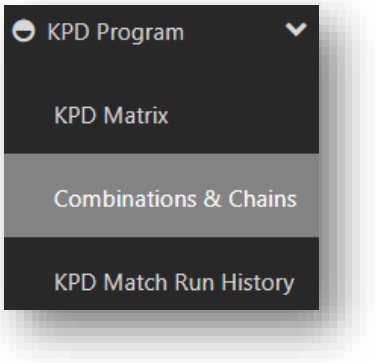
Once a chain is saved the process needs to be repeated to regenerate a new batch of possible chains from the remaining active pairs in the matrix.

2.7 LOOK AT COMBINATIONS AND CHAINS

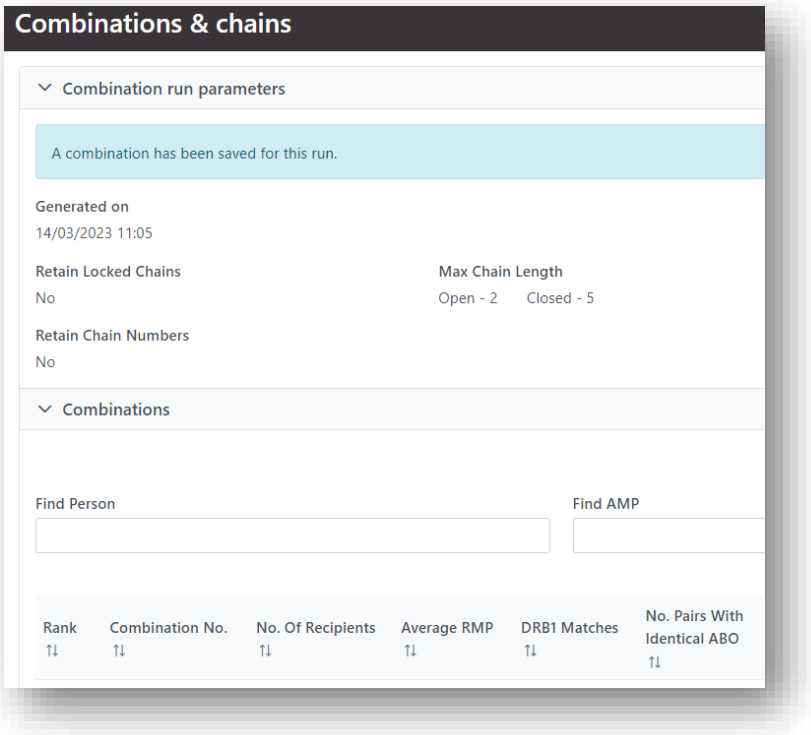
Once the combinations have been generated you can look at these along with the chains that they are formed from.

COMBINATION

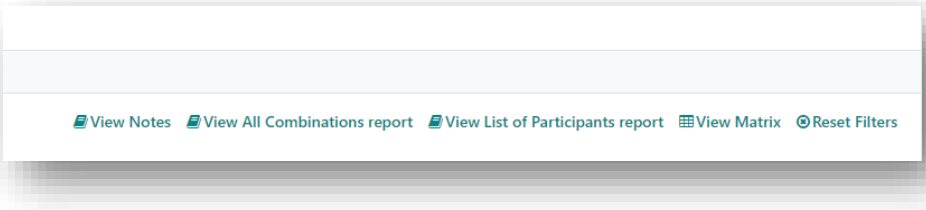
1. From the navigation pane, click **KPD Program**, and then click **Combinations and Chains**.



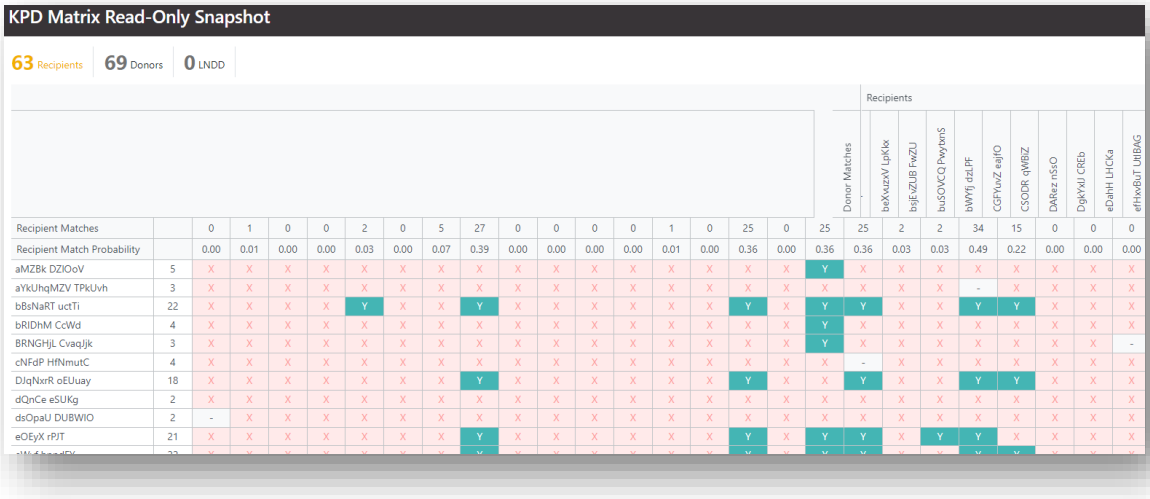
2. You will see the **Combination run parameters** that were used to create the latest combinations in the top section.



3. Look at the **View All Combinations report** and the **View List of Participants** report by clicking on the links.



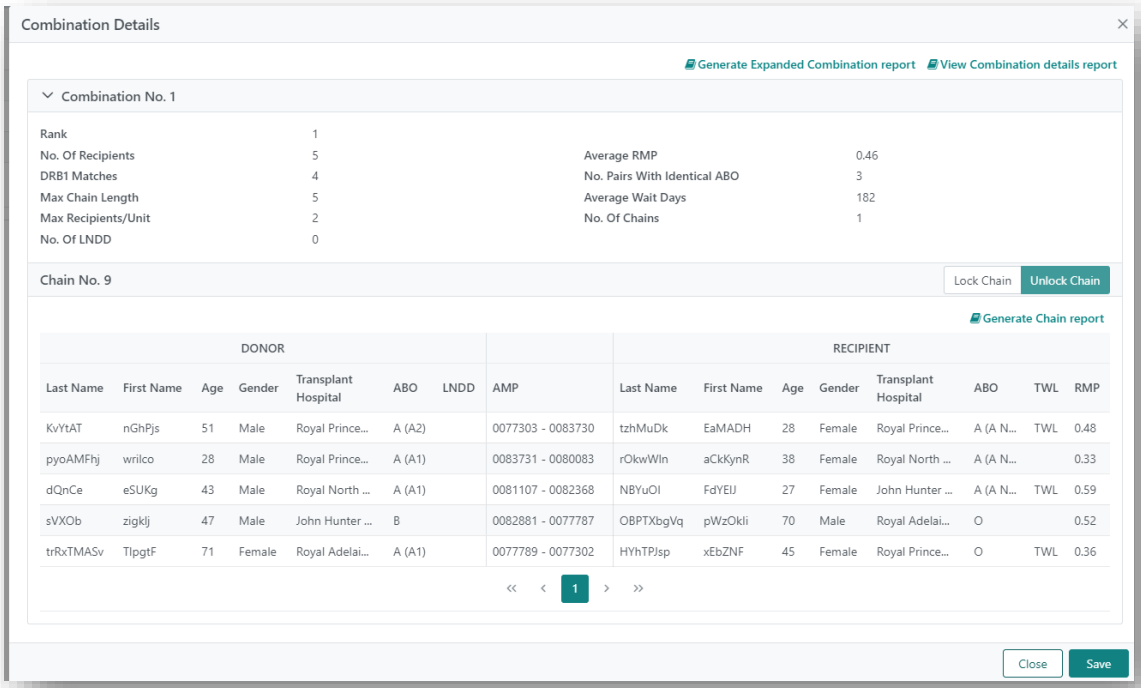
4. Click **View Matrix** to view a snapshot of the KDP matrix taken when the combinations were formed by . Note that this is a read-only snapshot and may not accurately reflect the current situation.



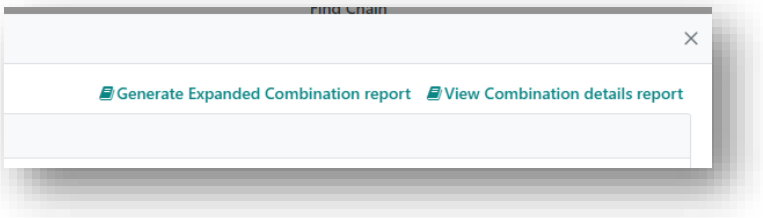
Click the browser back button to return to the **Combinations & Chains** screen.

5. To look at which chains make up a combination, click a combination in the list.

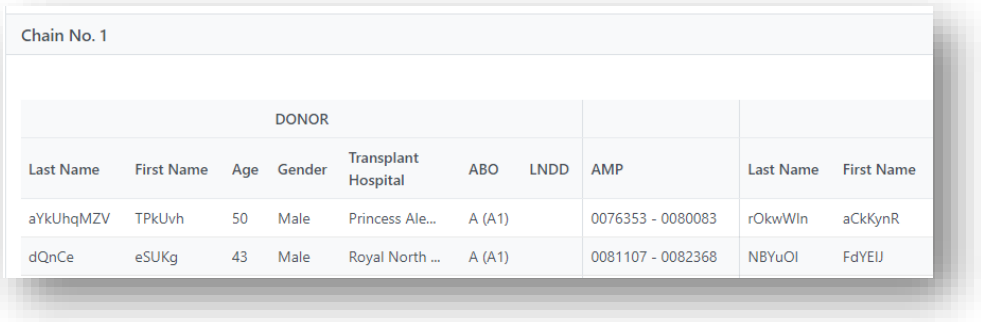
6. Click a combination to look at the chains it was formed from.



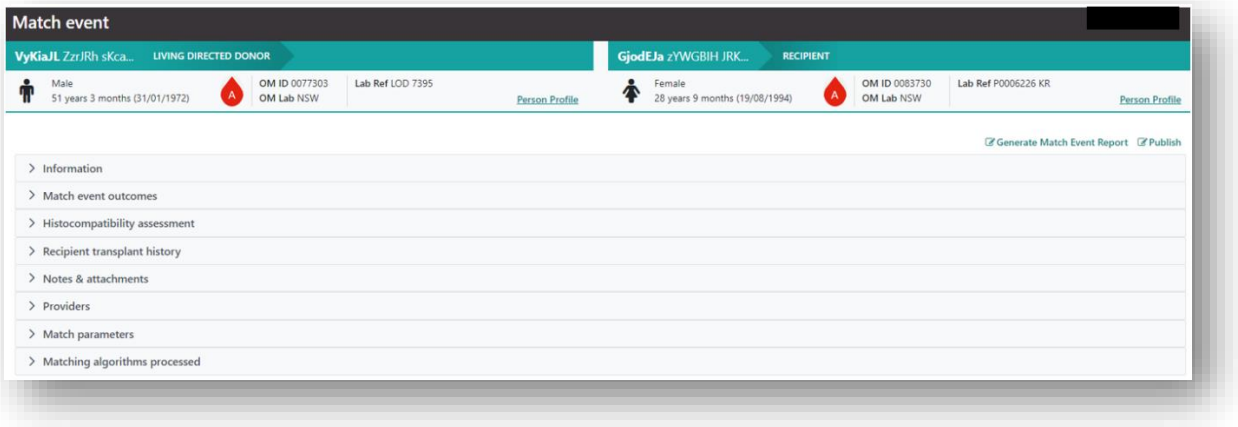
7. Click **View Combination details report** to see the information in report form.



8. Below the combinations details, you can see the **chains** of AMPs.



9. Click an AMP row to open the match event for the pair.

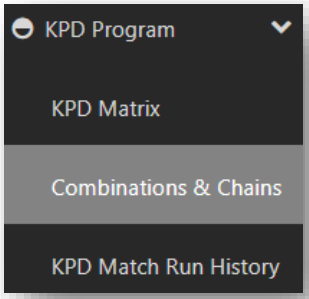


Click the browser back button to return to the **Combination details** box.

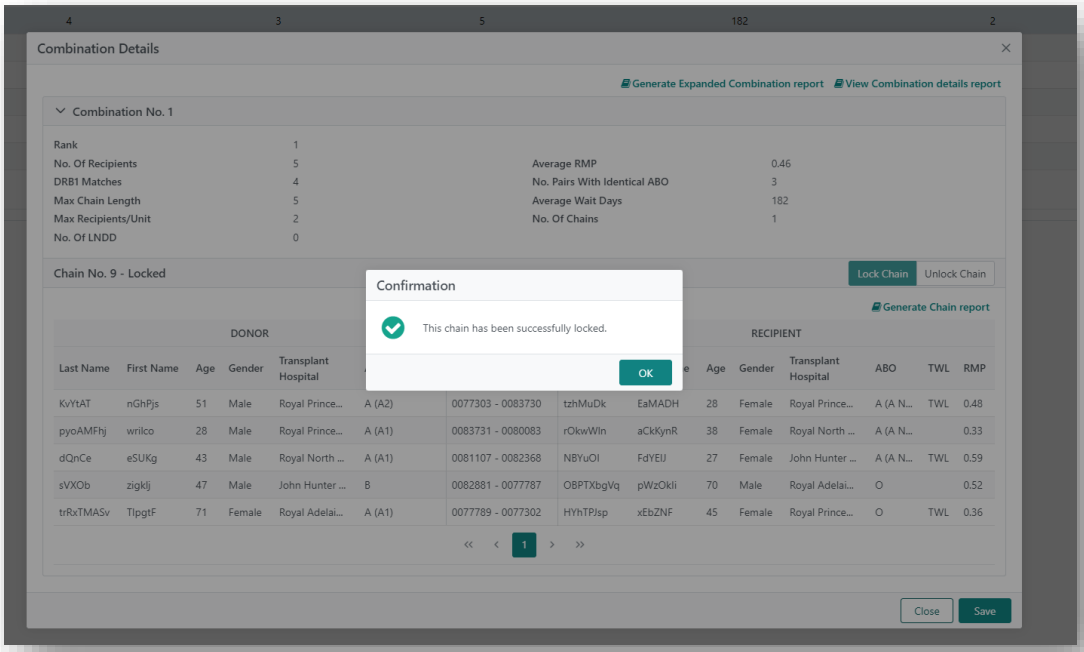
2.8 LOCK AND UNLOCK A CHAIN

When any chain of people is locked, if you generate a new combination you have the option to either retain and use the locked chains or to discard them and start again. If you elect to retain locked chains, then every combination generated must use all locked chains.

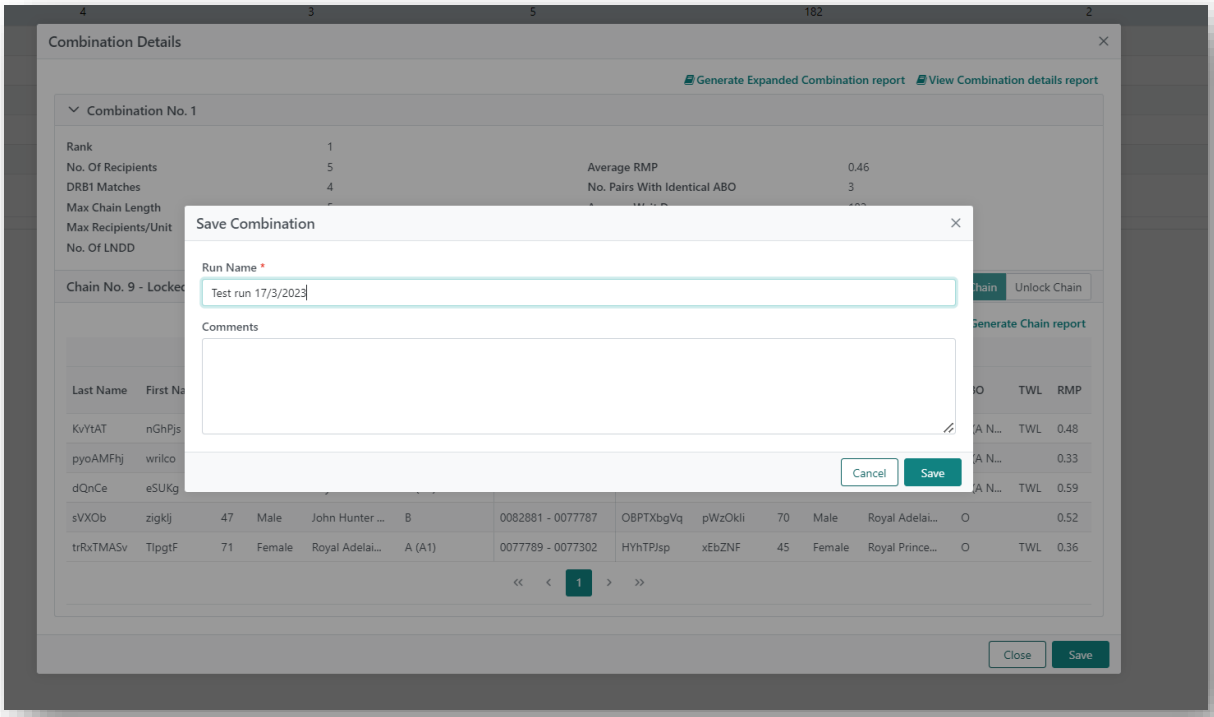
1. From the navigation pane, click **KPD Program**, and then click **Combinations & Chains**. Click a combination to view the chains it is formed from.



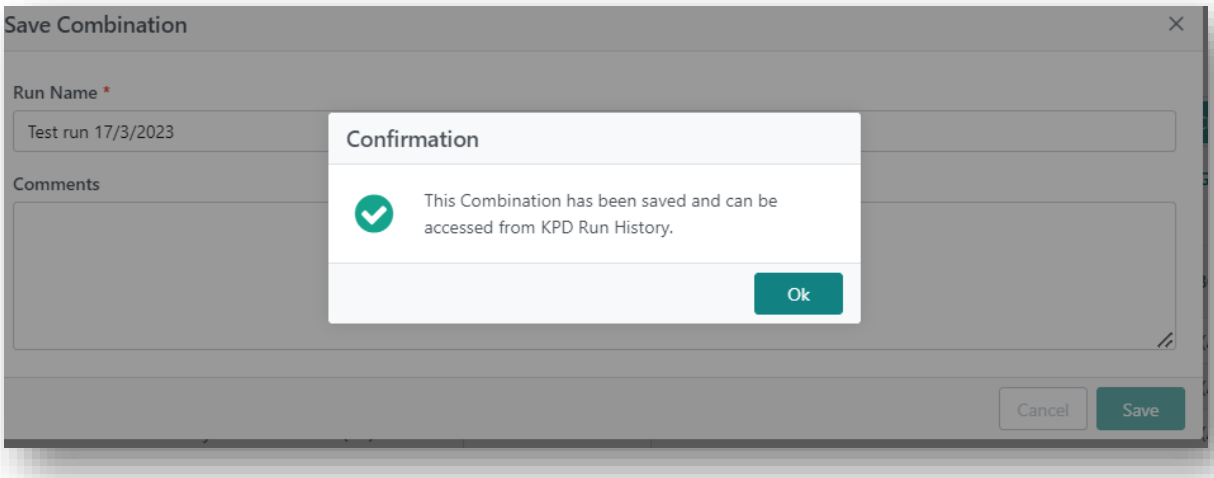
2. Click **Lock Chain** to lock the chain.



3. Click **OK**.



4. Click **Save**, add **Run Name** and click **Save**.



This action publishes the chain and is now viewable in KPD Match Run History

Patient and Donor KPD enrolment status is changed to “On hold” with the reason “Due to KPD Chain” when chain is published

Unlocking a chain must occur , once the transplant surgeries and booked , and the transplants need to be linked via the match event outcome.

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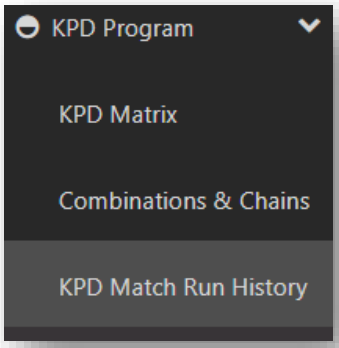
3. KPD MATCH RUN HISTORY

You can look at details of previously published KPD match runs.

1. From the navigation pane, click **KPD Program**, and then click **KPD Match Run History**.



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2. The match run history page is shown:

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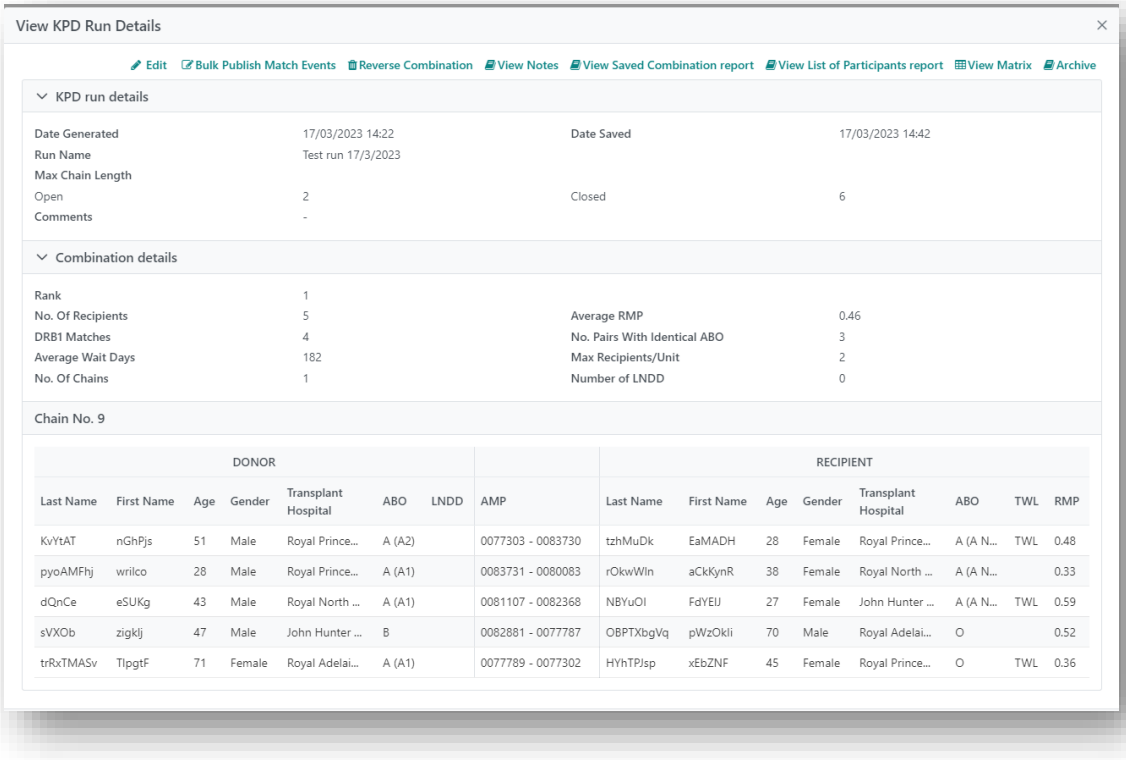
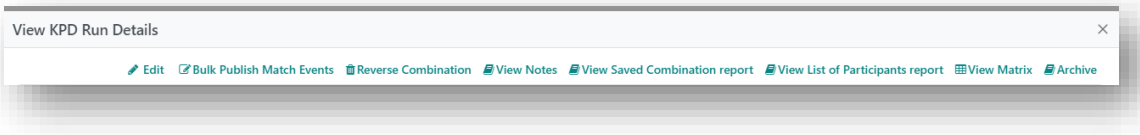
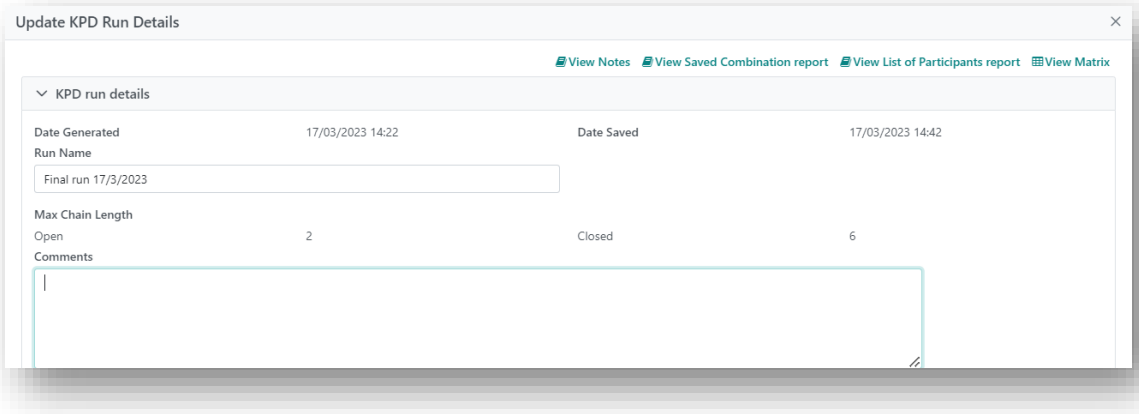
3. Click on a row to look at the details of the run.



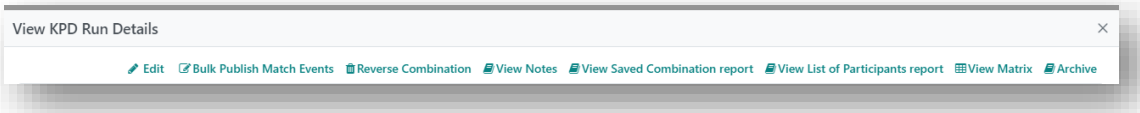
4. Click the **Edit** link to change the run name and enter comments.





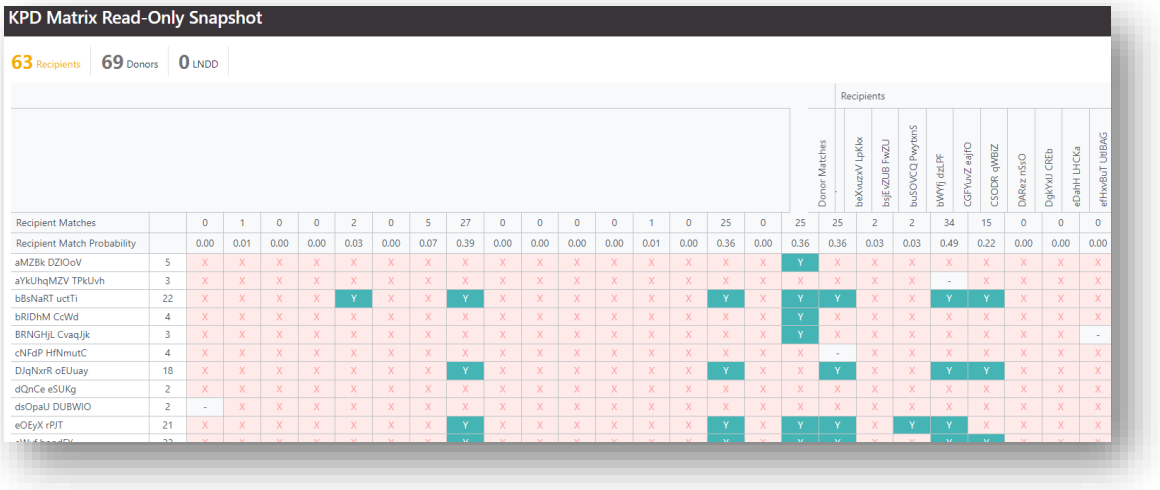
5. Click **Save** to save your changes, or **Cancel** to return to the **View KPD Run Details** box without saving changes to the **Run Name** or **Comments** field(s).

6. You can look at the **View Published Combination report**, **View All Combinations report** or the **View List of Participants report** by clicking on the links.



7. You can view a snapshot of the KPD matrix that was taken when the match run was published.

Note – this is a read only snapshot and may not accurately reflect the current situation.

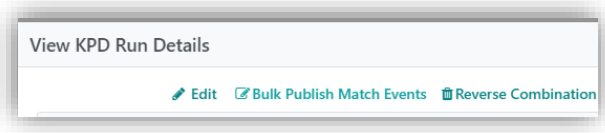


8. Click the browser back button to return to the **KPD Match Run History** screen.

3.1 REVERSING CHAIN

If chain is broken, and the pairs need to be returned to the pool for matching, Click **Reverse Combination**.

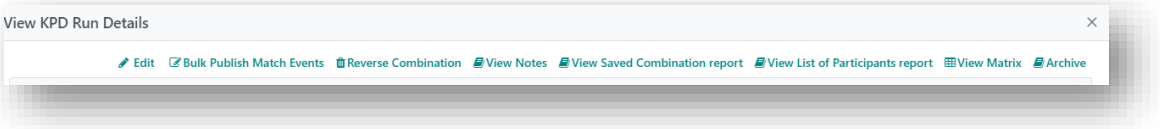
This automatically reverses the KPD enrolments to Active for all the recipients and donors in the chain. If the patient also has a TWL enrolment the status will be returned to its previous state.



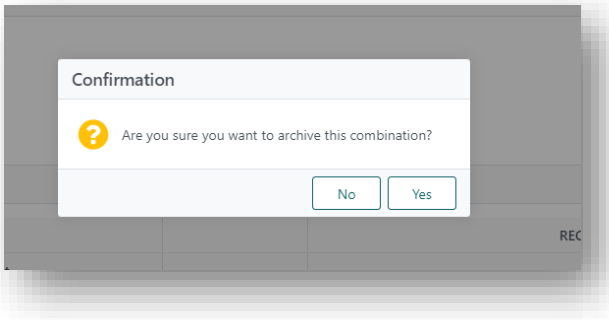
3.2 ARCHIVE A CHAIN

A chain can be moved into the history tab in the KPD run history

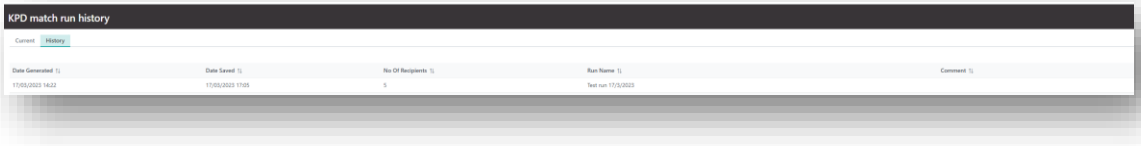
1. Click **Archive**



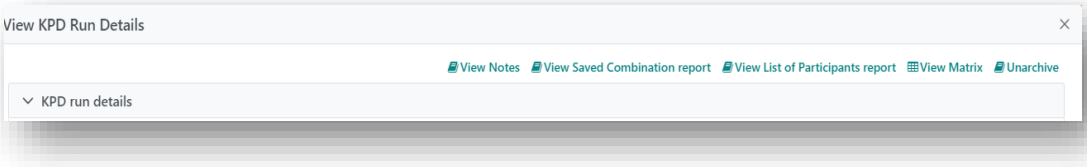
2. You will be asked to confirm



3. Click **Yes.** The combination will be moved to history



4. To unarchive the Combination, Select **Unarchive** . The combination will return to the Current KPD match run history.



APPENDIX 1 – ABO COMPATIBILITY TABLE

Donor ABO	Donor Subtype	Recipient ABO	Recipient Subtype
A	A1	A	A1
A	A1	A	A2
A	A1	A	A Intermediate
A	A1	A	A Not defined/tested
A	A2	A	A1
A	A2	A	A2
A	A2	A	A Intermediate
A	A2	A	A Not defined/tested
A	A Intermediate	A	A1
A	A Intermediate	A	A2
A	A Intermediate	A	A Intermediate
A	A Intermediate	A	A Not defined/tested
A	A Not defined/tested	A	A1
A	A Not defined/tested	A	A2
A	A Not defined/tested	A	A Intermediate
A	A Not defined/tested	A	A Not defined/tested
A	A1	AB	A1B
A	A2	AB	A1B
A	A Intermediate	AB	A1B
A	A Not defined/tested	AB	A1B
A	A1	AB	A2B
A	A2	AB	A2B
A	A Intermediate	AB	A2B

A	A Not defined/tested	AB	A2B
A	A1	AB	A Intermediate B
A	A2	AB	A Intermediate B
A	A Intermediate	AB	A Intermediate B
A	A Not defined/tested	AB	A Intermediate B
A	A1	AB	AB Not defined/tested
A	A2	AB	AB Not defined/tested
A	A Intermediate	AB	AB Not defined/tested
A	A Not defined/tested	AB	AB Not defined/tested
AB	A1B	AB	A1B
AB	A1B	AB	A2B
AB	A1B	AB	A Intermediate B
AB	A1B	AB	AB Not defined/tested
AB	A2B	AB	A1B
AB	A2B	AB	A2B
AB	A2B	AB	A Intermediate B
AB	A2B	AB	AB Not defined/tested
AB	A intermediate B	AB	A1B
AB	A intermediate B	AB	A2B
AB	A intermediate B	AB	A Intermediate B
AB	A intermediate B	AB	AB Not defined/tested
AB	AB Not defined/tested	AB	A1B
AB	AB Not defined/tested	AB	A2B
AB	AB Not defined/tested	AB	A Intermediate B

AB	AB Not defined/tested	AB	AB Not defined/tested
B	N/A	B	N/A
B	N/A	AB	A1B
B	N/A	AB	A2B
B	N/A	AB	A Intermediate B
B	N/A	AB	AB Not defined/tested
O	N/A	A	A1
O	N/A	A	A2
O	N/A	A	A Intermediate
O	N/A	A	A Not defined/tested
O	N/A	B	N/A
O	N/A	AB	A1B
O	N/A	AB	A2B
O	N/A	AB	A Intermediate B
O	N/A	AB	AB Not defined/tested
O	N/A	O	N/A

APPENDIX 2 – ABOI ACCEPTABILITY TABLE

Donor ABO	Donor Subtype	Recipient ABO	Recipient Subtype
A	A1	A	A1
A	A1	A	A2
A	A1	A	A Intermediate
A	A1	A	A Not defined/tested
A	A2	A	A1
A	A2	A	A2
A	A2	A	A Intermediate

A	A2	A	A Not defined/tested
A	A Intermediate	A	A1
A	A Intermediate	A	A2
A	A Intermediate	A	A Intermediate
A	A Intermediate	A	A Not defined/tested
A	A Not defined/tested	A	A1
A	A Not defined/tested	A	A2
A	A Not defined/tested	A	A Intermediate
A	A Not defined/tested	A	A Not defined/tested
A	A1	AB	A1B
A	A2	AB	A1B
A	A Intermediate	AB	A1B
A	A Not defined/tested	AB	A1B
A	A1	AB	A2B
A	A2	AB	A2B
A	A Intermediate	AB	A2B
A	A Not defined/tested	AB	A2B
A	A1	AB	A Intermediate B
A	A2	AB	A Intermediate B
A	A Intermediate	AB	A Intermediate B
A	A Not defined/tested	AB	A Intermediate B
A	A1	AB	AB Not defined/tested
A	A2	AB	AB Not defined/tested
A	A Intermediate	AB	AB Not defined/tested

A	A Not defined/tested	AB	AB Not defined/tested
AB	A1B	AB	A1B
AB	A1B	AB	A2B
AB	A1B	AB	A Intermediate B
AB	A1B	AB	AB Not defined/tested
AB	A2B	AB	A1B
AB	A2B	AB	A2B
AB	A2B	AB	A Intermediate B
AB	A2B	AB	AB Not defined/tested
AB	A intermediate B	AB	A1B
AB	A intermediate B	AB	A2B
AB	A intermediate B	AB	A Intermediate B
AB	A intermediate B	AB	AB Not defined/tested
AB	AB Not defined/tested	AB	A1B
AB	AB Not defined/tested	AB	A2B
AB	AB Not defined/tested	AB	A Intermediate B
AB	AB Not defined/tested	AB	AB Not defined/tested
B	N/A	B	N/A
B	N/A	AB	A1B
B	N/A	AB	A2B
B	N/A	AB	A Intermediate B
B	N/A	AB	AB Not defined/tested
O	N/A	A	A1
O	N/A	A	A2
O	N/A	A	A Intermediate

O	N/A	A	A Not defined/tested
O	N/A	B	N/A
O	N/A	AB	A1B
O	N/A	AB	A2B
O	N/A	AB	A Intermediate B
O	N/A	AB	AB Not defined/tested
O	N/A	O	N/A
A	A1	B	N/A
A	A2	B	N/A
A	A Intermediate	B	N/A
A	A Not defined/tested	B	N/A
A	A1	O	N/A
A	A2	O	N/A
A	A Intermediate	O	N/A
A	A Not defined/tested	O	N/A
B	N/A	A	A1
B	N/A	A	A2
B	N/A	A	A Intermediate
B	N/A	A	A Not defined/tested
B	N/A	O	N/A
AB	A1B	A	A1
AB	A1B	A	A2
AB	A1B	A	A Intermediate
AB	A1B	A	A Not defined/tested
AB	A2B	A	A1

AB	A2B	A	A2
AB	A2B	A	A Intermediate
AB	A2B	A	A Not defined/tested
AB	A Intermediate B	A	A1
AB	A Intermediate B	A	A2
AB	A Intermediate B	A	A Intermediate
AB	A Intermediate B	A	A Not defined/tested
AB	AB Not defined/tested	A	A1
AB	AB Not defined/tested	A	A2
AB	AB Not defined/tested	A	A Intermediate
AB	AB Not defined/tested	A	A Not defined/tested
AB	A1B	B	N/A
AB	A2B	B	N/A
AB	A Intermediate B	B	N/A
AB	AB Not defined/tested	B	N/A
AB	A1B	O	N/A
AB	A2B	O	N/A
AB	A Intermediate B	O	N/A
AB	AB Not defined/tested	O	N/A

DEFINITIONS

Term/abbreviation	Definition
ARP (ASX Registered pair)	A recipient/donor pair who came into the KPD pathway together. They are not compatible (if they were they would be enrolled in the LDD pathway).
AMP (ASX Matched pair)	A recipient/donor pair who have been assessed as compatible by OrganMatch.
Readiness	Criteria that need to be met for a patient and donor to be matched

REFERENCED INTERNAL DOCUMENTS

Document number	Source
OM-27 for Registration in KPD	Insert link to Web Page

CHANGE HISTORY

Version number	Effective date	Summary of change
1	Refer to footer	New version of document

ELECTRONIC SIGNATURE

Author	NARELLE WATSON
Approver(s)	REEBCCA SCAMMELL