NHS BLOOD AND TRANSPLANT

KIDNEY ADVISORY GROUP

REVIEW OF MATCHABILITY SCORE BANDINGS

BACKGROUND

1   On 11th September 2019 a new kidney offering scheme was introduced in the UK. The scheme was designed to meet several key objectives including increasing offers for hard to match recipients. Matchability score plays an important role in the 2019 KOS, as recipients with matchability score 10 would be classed as Tier A and matchability score is used as a factor to prioritise all recipients within each tier. Further details on the 2019 KOS can be found in the Kidney Allocation Policy (POL186), here https://www.odt.nhs.uk/transplantation/tools-policies-and-guidance/policies-and-guidance/.

2   Matchability scores are calculated by first counting the number of blood group identical donors each active recipient on the waiting list matches with (level 1 or 2 mismatch), from a pool of 10,000 recent donors with HLA data recorded. This 'number of matches' is used to create deciles for each ABO blood group, i.e., recipients are categorised into ten equally sized groups based on their number of matches. These deciles are used to define the bandings for the matchability scores. For example, a blood group O recipient who matched with between 0 and 5 donors from the donor pool would receive a matchability score of 10, whereas a recipient with 6 to 37 matches would receive a matchability score of 9, etc.

3   Prior to the 2019 KOS, matchability scores were recalculated annually for all active recipients on the waiting list based on the most recent 10,000 donors. This, however, has not been done since the start of the new scheme. As the scheme was successful in reducing the proportion of difficult to match recipients on the waiting list, the update to the matchability bands may make it easier for recipients to be scored higher than they are currently scored.

4   This paper looks at the impact of calculating the matchability scores using the most recent donor pool and recipient cohort, in which there are fewer difficult to match recipients. The purpose of this paper is to provide data to make the decision on whether the matchability bandings should be updated.

5   Additionally, this paper looks to review the bandings for blood group AB recipients. Currently it is not possible for a blood type AB recipient to have a matchability score of 10.

DATA AND METHODS

6   Data were obtained from the UK Transplant Registry on active recipients on the kidney transplant waiting list, as of 26th June 2023. Data were also obtained from a test environment of the UK Transplant Registry, which has a snapshot of the relevant data from March 2023. This test environment was used to test run the matchability score bandings update, with the most recent donor pool and recipient cohort.

7   This analysis compares the current matchability scores of active recipients to their proposed new score if the matchability update was implemented. The results presented here are based on the test run of this update, and outcomes will differ slightly if the update is implemented. The resulting impact on the proportion of Tier A recipients is described, as well as the impact for recipients with blood group AB.

RESULTS

8   **Tables 1 and 2** show the number and percentage of active recipients on the waiting list by both their current matchability score and their proposed matchability score. This shows how recipients' matchability scores could change if the bands are updated. The tables have been colour-coded, similar to a heatmap, to show the spread of recipients for each current matchability score, with green representing larger numbers and yellow representing smaller numbers.

9   These tables show that there would be a shift of recipients moving into higher matchability scores, with more movement in the moderate and hard to match groups. For example, of all recipients who are currently defined as matchability score 9, 62% move into matchability score 10 with the updated bands, and for those currently defined as matchability score 8, 87% move to matchability score 9.

Table 1 **Number of active recipients on waiting list, by current matchability score and proposed matchability score**

Current matchability score	Proposed matchability score – number of recipients										Total
	1	2	3	4	5	6	7	8	9	10	
1	408	69	1	-	-	-	-	-	-	-	478
2	6	341	126	4	-	-	1	-	-	-	478
3	2	3	315	198	9	1	1	-	-	-	529
4	-	1	3	207	246	20	1	1	-	-	479
5	-	-	-	3	158	322	42	2	4	1	532
6	-	-	1	1	-	86	358	54	7	1	508
7	-	-	-	-	1	4	51	343	72	-	471
8	-	-	1	-	3	-	2	34	281	1	322
9	-	-	-	-	-	1	1	1	94	159	256
10	-	-	-	-	-	-	-	-	1	292	293
Total	416	414	447	413	417	434	457	435	459	454	4346

Table 2 **Percentage of active recipients on waiting list, by current matchability score and proposed matchability score**

Current matchability score	Proposed matchability score – percentage of recipients (%)										Total
	1	2	3	4	5	6	7	8	9	10	
1	85	14	0	-	-	-	-	-	-	-	11
2	1	71	26	1	-	-	0	-	-	-	11
3	0	1	60	37	2	0	0	-	-	-	12
4	-	0	1	43	51	4	0	0	-	-	11
5	-	-	-	1	30	61	8	0	1	0	12
6	-	-	0	0	-	17	70	11	1	0	12
7	-	-	-	-	0	1	11	73	15	-	11
8	-	-	0	-	1	-	1	11	87	0	7
9	-	-	-	-	-	0	0	0	37	62	6
10	-	-	-	-	-	-	-	-	0	100	7
Total	10	10	10	10	10	10	11	10	11	10	100

10   **Table 3** shows the number and percentage of active recipients on the waiting list by tier. This is shown for the following three scenarios, as at 1 September 2019, with the current data and matchability scores, and with the proposed (test) matchability scores. **Table 4** shows how recipients' matchability scores could change if the bands were updated.

11   Currently 9% of all active recipients are classed as Tier A, and if the update to matchability scores were implemented, this could increase to 11%. This could result in a disadvantage for other recipient groups, as Tier A recipients receive

priority in the current offering scheme. However, the proportion of Tier A recipients prior to the 2019 KOS being introduced was 17%, and so the update should have less of an impact than that was seen at the start of the current scheme. **Table 4** then shows that 101 recipients would move from Tier B to Tier A, and 1 recipient would move from Tier A to Tier B.

Table 3   **Number and percentage of active recipients on the waiting list by tier, at September 2019, and June 2023 using both the current and new matchability score**

Tier	Sept 2019		Current data		Proposed data	
	N	%	N	%	N	%
A	846	17	386	9	486	11
B	4077	83	3960	91	3860	89

Table 4   **Number of active recipients on waiting list, by the potential movement across tiers if update was implemented**

Current tier	Tier in test data - N		
	A	B	Total
A	385	1	386
B	101	3859	3960
Total	486	3860	4346

12   **Table 5** shows the matchability bandings for recipients in blood group AB. The lower and upper values give the range of matches that recipients require to receive each score, e.g., currently a recipient of blood type AB who matched with 20 or more donors from the donor pool, would receive a matchability score of 1. As there are fewer recipients of this blood type, it is difficult to create ten equally sized bands. So, recipients are currently scored into one of 8 bands, with scores from 1-7 or 9. However, this means that a recipient of blood group AB cannot enter Tier A based only on their matchability score. The proposed banding for this blood group would be to score recipients from 1-6, 8 and 10.

Table 5   **Lower and upper values of matchability score bands for blood group AB, for both current bands and proposed bands**

Score	Current bands		Proposed bands	
	Lower	Upper	Lower	Upper
1	20	99999	18	99999
2	14	19	13	17
3	10	13	10	12
4	7	9	8	9
5	4	6	6	7
6	2	3	4	5
7	1	1		
8			2	3
9	0	0		
10			0	1

13   **Table 6** shows the number of blood group AB recipients on the waiting list by tier, for both the current tier and the proposed tier. The proposed tier is defined as those with zero matches (and a proposed matchability score of 10), 100% cRF or 7 or more years waiting time. This is to show the effect of only moving the scores 7 and 9 to 8 and 10 for blood group AB. If the highest score for blood group AB recipients was 10 rather than 9, then an extra two recipients would move into Tier A.

Table 6   **Number and percentage of blood group AB recipients by tier, for current bands and proposed bands**

Tier	Current data		Proposed data	
	N	%	N	%
A	24	20	26	22
B	94	80	92	78

SUMMARY

14   An update to the matchability bands would result in a change to the spread of recipients across the matchability bands, with more recipients now falling into the higher bands. This would result in a slight increase in the proportion of Tier A recipients, potentially increasing from 9% to 11%.

15   Currently, blood group AB recipients cannot fall into Tier A based on their matchability score alone. Changing the matchability bands for this blood group, would result in a small number of difficult to match recipients moving into Tier A.

RECOMMENDATIONS FOR CONSIDERATION

1   KAG members are asked to consider an update to the matchability bands using the most recent donor pool and active recipient cohort. This update would result in a small increase to the proportion of Tier A recipients. Recipients' matchability scores will in general increase, making it easier for moderate to match recipients to now receive a transplant.

       a.   KAG members are asked to consider and support the recommendation that matchability banding in the future is revised every 2-years.

2   KAG members are asked to consider and support the recommendation that the matchability bandings for blood group AB should be amended to make matchability score 10 possible for these recipients.

If approved by KAG members, the update to matchability bandings could be updated in September 2023.

Shaminie Shanmugaranjan   **July 2023**
Statistics and Clinical Studies

APPENDIX 1   **Lower and upper values of matchability score bands, for both the current bands and proposed bands**

Blood group	Score	Current		Proposed	
		Lower	Upper	Lower	Upper
O	1	392	99999	399	99999
O	2	299	391	306	398
O	3	222	298	244	305
O	4	171	221	191	243
O	5	131	170	154	190
O	6	99	130	125	153
O	7	70	98	97	124
O	8	38	69	67	96
O	9	6	37	25	66
O	10	0	5	0	24
A	1	333	99999	346	99999
A	2	255	332	266	345
A	3	196	254	207	265
A	4	148	195	171	206
A	5	113	147	137	170
A	6	83	112	105	136
A	7	47	82	79	104
A	8	14	46	53	78
A	9	2	13	6	52
A	10	0	1	0	5
B	1	73	99999	71	99999
B	2	54	72	55	70
B	3	41	53	44	54
B	4	33	40	36	43
B	5	27	32	30	35
B	6	21	26	24	29
B	7	15	20	19	23
B	8	8	14	14	18
B	9	2	7	6	13
B	10	0	1	0	5
AB	1	20	99999	18	99999
AB	2	14	19	13	17
AB	3	10	13	10	12
AB	4	7	9	8	9
AB	5	4	6	6	7
AB	6	2	3	4	5
AB	7	1	1		
AB	8			2	3
AB	9	0	0		
AB	10			0	1