

Adding HLA DQA1 Unacceptable Antigen Equivalences Table

Sponsoring Committee: Histocompatibility Committee
Policy/Bylaws Affected: Policy 4.10 (Reference Tables of HLA Antigen Values and Split Equivalences)
Public Comment: January 25, 2016 – March 25, 2016
Effective Date: Effective once policy is implemented and when members are notified

Problem Statement

This project is in response to a potential patient safety issue that appeared when the Expanding HLA Typing policy was implemented in January 2016. The Histocompatibility Committee noticed that the programming change potentially allowed candidates to match with donors that had incompatible antigens. Specifically, the programming did not exclude the subtype antigen when a broad parent type antigen was selected so that a candidate could match with a donor who had an incompatible subtype, even though the broad parent category of antigens was selected. The Committee resolved to fix the problem by adding an equivalency table detailing the relationship between the broad parent types and their subtypes.

Summary of Changes

The policy change will:

- Add an HLA-DQA1 unacceptable antigen table
- Allow for more consistent use of the terms “candidate” and “patient” throughout policy
- Move examples of how to read unacceptable antigen and matching tables from beneath the tables to before the tables, respectively

What Members Need to Do

You need to familiarize yourselves with the changes in the WaitListSM unacceptable antigen entry page. Once this proposal is implemented, you will be able to select broad categories of antigens to exclude all associated subtypes.

You will also need to work with third-party vendors to determine how the changes affect electronic uploads of candidate unacceptable antigen data.

Affected Policy/Bylaw Language:

New language is underlined and language that will be deleted is ~~struck through~~.

4.10 Reference Tables of HLA Antigen Values and Split Equivalences

Tables 4-2, 4-3, and 4-4 show candidate-donor antigen ~~combinations~~ equivalencies and whether they are mismatches. For each candidate antigen, the donor antigens that are not mismatched are listed below. All other combinations are considered mismatches.

Examples of how “Matching Antigen Equivalences” works:

- If the candidate types as B70: only donors that type as B70 are considered matched. Donors typed as B71 or B72 are considered mismatched.
- If the candidate types as B71: only donors that type as B71 or B1510 are considered matched.

Donors typed as B70 are considered mismatched.

Table 4-2: HLA A Matching Antigen Equivalences

Patient Candidate A-Locus Antigen	Equivalent Donor Antigens
1	1
2	2, 0201, 0202, 0203, 0205, 0206
0201	0201, 2
0202	0202, 2
0203	0203, 2
0205	0205, 2
0206	0206, 2
3	3
9	9
10	10
11	11, 1101, 1102
1101	1101, 11
1102	1102, 11
19	19
23	23

Patient Candidate A-Locus Antigen	Equivalent Donor Antigens
24	24, 2402, 2403
2402	2402, 24
2403	2403, 24
25	25
26	26
28	28
29	29, 2901, 2902
2901	2901, 29
2902	2902, 29
30	30, 3001, 3002
3001	3001, 30
3002	3002, 30
31	31
32	32
33	33, 3301, 3303

Patient Candidate A-Locus Antigen	Equivalent Donor Antigens
3301	3301, 33
3303	3303, 33
34	34
3401	3401, 34
3402	3402, 34
36	36
43	43
66	66, 6601, 6602
6601	6601, 66
6602	6602, 66
68	68, 6801, 6802
6801	6801, 68
6802	6802, 68
69	69
74	74
80	80

Table 4-3: HLA B Matching Antigen Equivalences

Patient Candidate B_Locus Antigen	Equivalent Donor Antigens
5	5
7	7, 0702
0702	0702, 7
8	8
0802	0802
0803	0803
0804	0804
12	12
13	13, 1301, 1302
1301	1301, 13
1302	1302, 13
14	14
1401	1401, 64
1402	1402, 65
15	15
1501	1501, 62
1502	1502, 75
1503	1503, 72
1510	1510, 71
1511	1511, 75
1512	1512, 76
1513	1513, 77
1516	1516, 63
1517	1517, 63
16	16
17	17
18	18
21	21
22	22
27	27, 2705
2705	2705, 27

Patient Candidate B_Locus Antigen	Equivalent Donor Antigens
2708	2708
35	35
37	37
38	38
39	39, 3901, 3902, 3905, 3913
3901	3901, 39
3902	3902, 39
3905	3905, 39
3913	3913, 39
40	40
4001	4001, 60
4002	4002, 61
4005	4005, 50
4006	4006, 61
41	41
42	42
44	44, 4402, 4403
4402	4402, 44
4403	4403, 44
4415	4415, 45
45	45, 4415
46	46
47	47
48	48
49	49
50	50, 4005
51	51, 5101, 5102
5101	5101, 51

Patient Candidate B_Locus Antigen	Equivalent Donor Antigens
5102	5102, 51
52	52
53	53
54	54
55	55
56	56
57	57, 5701, 5703
5701	5701, 57
5703	5703, 57
58	58
59	59
60	60, 4001
61	61, 4002, 4006
62	62, 1501
63	63, 1516, 1517
64	64, 1401
65	65, 1402
67	67
70	70
71	71, 1510
72	72, 1503
73	73
75	75, 1502, 1511
76	76, 1512
77	77, 1513
78	78
81	81
82	82

Table 4-4: HLA DR Matching Antigen Equivalence

Patient Candidate DR-Locus Antigen	Equivalent Donor Antigens	Patient Candidate DR-Locus Antigen	Equivalent Donor Antigens	Patient Candidate DR-Locus Antigen	Equivalent Donor Antigens
1	1, 0101, 0102	8	8	1401	1401, 14, 1454
0101	0101, 1	9	9	1402	1402, 14
0102	0102, 1	0901	0901, 9	1403	1403, 14
103	103	0902	0902, 9	1404	1404, 14
2	2	10	10	1454	1454, 14, 1401
3	3	11	11	15	15
0301	0301, 17	1101	1101, 11	1501	1501, 15
0302	0302, 18	1104	1104, 11	1502	1502, 15
4	4	12	12	1503	1503, 15
0401	0401, 4	1201	1201, 12	16	16
0402	0402, 4	1202	1202, 12	1601	1601, 16
0403	0403, 4	13	13, 1301, 1303	1602	1602, 16
0404	0404, 4	1301	1301, 13	17	17, 0301
0405	0405, 4	1303	1303, 13	18	18, 0302
0407	0407, 4	14	14, 1401, 1402, 1403, 1404, 1454		
5	5				
6	6				
7	7				

Examples of how “Matching Antigen Equivalences” works:

If the candidate types as B70: only donors that type as B70 are considered matched.

If the candidate types as B71: only donors that type as B71 or B1510 are considered matched.

Tables 4-5, 4-6, 4-7, 4-8, 4-9, 4-10, 4-11, 4-12, and 4-123, show candidate-donor unacceptable antigen combinations. For each candidate antigen, the donor antigens that are unacceptable are listed below. Table 4-14 shows additional unacceptable antigen equivalences to be used in the Calculated Panel Reactive Antibody (CPRA) only.

Examples of how “Unacceptable Antigen Equivalences” works:

If a candidate has B70 listed as an “unacceptable antigen”, donors typed as B70, B71, B72, 1503, or 1510 are considered unacceptable.

Table 4-5: HLA A Unacceptable Antigen Equivalences

Patient Candidate Unacceptable A-Locus Antigen	Donor Equivalent Antigen
1	1
2	2, 0201, 0202, 0203, 0205, 0206
0201	0201
0202	0202
0203	0203
0205	0205
0206	0206
3	3
9	9, 23, 24, 2402, 2403
10	10, 25, 26, 34, 3401, 3402, 66, 6601, 6602, 43
11	11, 1101, 1102
1101	1101
1102	1102

Patient Candidate Unacceptable A-Locus Antigen	Donor Equivalent Antigen
19	19, 29, 2901, 2902, 30, 3001, 3002, 31, 32, 33, 3301, 3303, 74
23	23
24	24, 2402, 2403
2402	2402
2403	2403
25	25
26	26
28	28, 68, 69, 6801, 6802
29	29, 2901, 2902
2901	2901
2902	2902
30	30, 3001, 3002
3001	3001
3002	3002
31	31

Patient Candidate Unacceptable A-Locus Antigen	Donor Equivalent Antigen
32	32
33	33, 3301, 3303
3301	3301
3303	3303
34	34, 3401, 3402
3401	3401
3402	3402
36	36
43	43
66	66, 6601, 6602
6601	6601
6602	6602
68	68, 6801, 6802
6801	6801
6802	6802
69	69
74	74
80	80

Table 4-6 HLA B Unacceptable Antigen Equivalences

Patient Candidate Unacceptable B₂ Locus Antigen	Donor Equivalent Antigens
5	5, 51, 5101, 5102
7	7, 0702
0702	0702
8	8
0802	0802
0803	0803
0804	0804
12	12, 44, 4402, 4403, 4415, 45
13	13, 1301, 1302
1301	1301
1302	1302
14	14, 64, 65, 1401, 1402
1401	1401
1402	1402
15	15, 62, 63, 75, 76, 77, 1501, 1502, 1503, 1510, 1511, 1512, 1513, 1516, 1517
1501	1501
1502	1502
1503	1503
1510	1510
1511	1511
1512	1512
1513	1513
1516	1516
1517	1517
16	16, 38, 39, 3901, 3902, 3905, 3913

Patient Candidate Unacceptable B₂ Locus Antigen	Donor Equivalent Antigens
17	17, 57, 5701, 5703, 58
18	18
21	21, 49, 50, 4005
22	22, 54, 55, 56
27	27, 2705, 2708
2705	2705
2708	2708
35	35
37	37
38	38
39	39, 3901, 3902, 3905, 3913
3901	3901
3902	3902
3905	3905
3913	3913
40	40, 60, 61, 4001, 4002
4001	4001, 60
4002	4002
4005	4005, 50
4006	4006
41	41
42	42
44	44, 4402, 4403
4402	4402
4403	4403
4415	4415, 45
45	45, 4415
46	46
47	47
48	48
49	49

Patient Candidate Unacceptable B₂ Locus Antigen	Donor Equivalent Antigens
50	50, 4005
51	51, 5101, 5102
5101	5101
5102	5102
52	52
53	53
54	54
55	55
56	56
57	57, 5701, 5703
5701	5701
5703	5703
58	58
59	59
60	60
61	61, 4002, 4006
62	62, 1501
63	63, 1516
64	64, 1401
65	65, 1402
67	67
70	70, 71, 72, 1503, 1510
71	71, 1510
72	72, 1503
73	73
75	75, 1502, 1511
76	76, 1512
77	77, 1513
78	78
81	81
82	82

Patient Candidate Unacceptable B₂ Locus Antigen	Donor Equivalent Antigens
Bw4	Bw4, 0802, 0803, 0804, 5, 13, 1301, 1302, 1513, 1516, 1517, 17, 27, 37, 38, 44, 4402, 4403, 4415, 47, 49, 51, 5101, 5102, 52, 53, 57, 5701, 5703, 58, 59, 63, 77

Patient Candidate Unacceptable B₂ Locus Antigen	Donor Equivalent Antigens
Bw6	Bw6, 7, 0702, 8, 0801, 14, 1401, 1402, 1501, 1502, 1503, 1510, 1511, 1512, 18, 22, 2708, 35, 39, 3901, 3902, 3905, 3913, 40, 4001, 4002, 4006, 41, 42, 45, 48, 50, 4005, 54, 55, 56, 60, 61, 62, 64, 65, 67, 70, 71, 72, 75, 76, 78, 81, 82

Table 4-7: HLA C Unacceptable Antigen Equivalences

Patient Candidate Unacceptable C₂ Locus Antigen	Donor Equivalent Antigens
01	01
02	02
03	03, 09, 10
04	04
05	05
06	06

Patient Candidate Unacceptable C₂ Locus Antigen	Donor Equivalent Antigens
07	07, 0701, 0702
0701	0701
0702	0702
08	08
09	09
10	10

Patient Candidate Unacceptable C₂ Locus Antigen	Donor Equivalent Antigens
12	12
14	14
15	15
16	16
17	17
18	18

Table 4-8: HLA DR Unacceptable Antigen Equivalences

Patient Candidate Unacceptable DR_Locus Antigen	Donor Equivalent Antigens	Patient Candidate Unacceptable DR_Locus Antigen	Donor Equivalent Antigens	Patient Candidate Unacceptable DR_Locus Antigen	Donor Equivalent Antigens
1	1, 0101, 0102	5	5, 11, 1101, 1104, 12, 1201, 1202	13	13, 1301, 1303
0101	0101			1301	1301
0102	0102	6	6, 13, 1301, 1303, 14, 1401, 1402, 1403, 1404, 1454	1303	1303
103	103			14	14, 1401, 1402, 1403, 1404, 1454
2	2, 15, 1501, 1502, 1503, 16, 1601, 1602	7	7	1401	1401
		8	8	1402	1402
3	3, 17, 18, 0301, 0302	9	9, 0901, 0902	1403	1403
0301	0301, 17	0901	0901	1404	1404
0302	0302, 18	0902	0902	1454	1454
4	4, 0401, 0402, 0403, 0404, 0405, 0407	10	10	15	15, 1501, 1502, 1503
0401	0401	11	11, 1101, 1104	1501	1501
0402	0402	1101	1101	1502	1502
0403	0403	1104	1104	1503	1503
0404	0404	12	12, 1201, 1202	16	16, 1601, 1602
0405	0405	1201	1201	1601	1601
0407	0407	1202	1202	1602	1602
				17	17, 0301
				18	18, 0302

Table 4-9: HLA DR51 Unacceptable Antigen Equivalences

Patient Candidate Unacceptable DR51_Locus Antigen	Donor Equivalent Antigens
5*01:01	5*01:01
5*02:02	5*02:02
51	51, 5*01:01, 5*02:02

Table 4-10: HLA DR52 Unacceptable Antigen Equivalences

Patient- Candidate Unacceptable DR52_Locus Antigen	Donor Equivalent Antigen
3*01:01	3*01:01
3*02:02	3*02:02
3*03:01	3*03:01
52	52, 3*01:01, 3*02:02, 3*03:01

Table 4-11: HLA DR53 Unacceptable Antigen Equivalences

Patient- Candidate Unacceptable DR53_Locus Antigen	Donor Equivalent Antigen
4*01:01	4*01:01
4*01:03	4*01:03
53	53, 4*01:01, 4*01:03

Table 4-12: HLA DQA1 Unacceptable Antigen Equivalences

<i>Candidate Unacceptable DQA1-Locus Antigen</i>	<i>Donor Equivalent Antigen</i>
<u>01</u>	<u>01, 01:01, 01:02, 01:03, 01:04, 01:05, 01:06, 01:07, 01:08, 01:09, 01:10, 01:11, 01:12</u>
<u>01:01</u>	<u>01:01</u>
<u>01:02</u>	<u>01:02</u>
<u>01:03</u>	<u>01:03</u>
<u>01:04</u>	<u>01:04</u>
<u>01:05</u>	<u>01:05</u>
<u>01:06</u>	<u>01:06</u>
<u>01:07</u>	<u>01:07</u>
<u>01:08</u>	<u>01:08</u>
<u>01:09</u>	<u>01:09</u>
<u>01:10</u>	<u>01:10</u>
<u>01:11</u>	<u>01:11</u>
<u>01:12</u>	<u>01:12</u>
<u>02</u>	<u>02, 02:01</u>
<u>02:01</u>	<u>02:01</u>
<u>03</u>	<u>03, 03:01, 03:02, 03:03</u>
<u>03:01</u>	<u>03:01</u>
<u>03:02</u>	<u>03:02</u>
<u>03:03</u>	<u>03:03</u>
<u>04</u>	<u>04, 04:01, 04:02, 04:04</u>
<u>04:01</u>	<u>04:01</u>
<u>04:02</u>	<u>04:02</u>

<i>Candidate Unacceptable DQA1-Locus Antigen</i>	<i>Donor Equivalent Antigen</i>
<u>04:03N</u>	<u>04:03N</u>
<u>04:04</u>	<u>04:04</u>
<u>05</u>	<u>05, 05:01, 05:02, 05:03, 05:04, 05:05, 05:06, 05:07, 05:08, 05:09, 05:10, 05:11</u>
<u>05:01</u>	<u>05:01</u>
<u>05:02</u>	<u>05:02</u>
<u>05:03</u>	<u>05:03</u>
<u>05:04</u>	<u>05:04</u>
<u>05:05</u>	<u>05:05</u>
<u>05:06</u>	<u>05:06</u>
<u>05:07</u>	<u>05:07</u>
<u>05:08</u>	<u>05:08</u>
<u>05:09</u>	<u>05:09</u>
<u>05:10</u>	<u>05:10</u>
<u>05:11</u>	<u>05:11</u>
<u>06</u>	<u>06, 06:01, 06:02</u>
<u>06:01</u>	<u>06:01</u>
<u>06:02</u>	<u>06:02</u>

Table 4-123: HLA DQB1 Unacceptable Antigen Equivalences

Patient- Candidate Unacceptable DQB1-Locus Antigen	Donor Equivalent Antigen
1	1, 5, 6, 0501, 0502, 0601, 0602, 0603, 0604, 0609
2	2, 0201, 0202
3	3, 7, 8, 9, 0301, 0302, 0303, 0319
0301	0301, 7
0302	0302, 8
0303	0303, 9
0319	0319, 7
4	4, 0401, 0402
0401	0401
0402	0402
5	5, 0501, 0502
0501	0501
0502	0502
6	6, 0601, 0602, 0603, 0604, 0609
0601	0601
0602	0602
0603	0603
0604	0604
0609	0609
7	7, 3, 0301, 0319

Patient Candidate Unacceptable DQB1-Locus Antigen	Donor Equivalent Antigens
8	8, 3, 0302
9	9, 3, 0303

Examples of how “Unacceptable Antigen Equivalences” works:

If a candidate has B70 listed as an “unacceptable antigen”, donors typed as B70, B71, B72, 1503, or 1510 are considered unacceptable.

Table 4-14 shows additional unacceptable antigen equivalences to be used in the Calculated Panel Reactive Antibody (CPRA) only.

Table 4-134: Additional Unacceptable Antigen Equivalences to be used in the Calculated Panel Reactive Antibody (CPRA) Only

Locus	Patient Unacceptable Antigen	Unacceptable DR antigen equivalences used for CPRA calculation
DR51	5*0101	2, 15, 16
	5*0202	2, 15, 16
	51	2, 15, 16
DR52	3*0101	3, 5, 6, 11, 12, 13, 14, 17, 18
	3*0202	3, 5, 6, 11, 12, 13, 14, 17, 18
	3*0301	3, 5, 6, 11, 12, 13, 14, 17, 18
	52	3, 5, 6, 11, 12, 13, 14, 17, 18
DR53	4*0101	4, 7, 9
	4*0103	4, 7, 9
	53	4, 7, 9