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| Type | Canadian Transplant Registry |
| Program | Inter-provincial Sharing: Kidney, Highly Sensitized Patient |
| Title | Matching and Ranking |

| | |
|--|---|
| Number | CTR.50.003 |
| Version | v3.0 |
| Committee Review | Kidney Transplant Advisory Committee (2015-09-23), Donation and Transplantation Administrators Advisory Committee (2015-10-24), Organ Donation and Transplantation Expert Advisory Committee (2015-11-27) |
| Committee Endorsement | Kidney Transplant Advisory Committee (2015-09-23), Donation and Transplantation Administrators Advisory Committee (2016-03-23), Organ Donation and Transplantation Expert Advisory Committee (2015-11-27) |
| Provincial/Territorial Sign-Off | 2016-06-20 (See Appendix A) |
| Effective Date | 2016-06-20 |

Purpose

The Canadian Transplant Registry (CTR) identifies transplant opportunities across Canada, for kidney transplant candidates who are highly sensitized to Human Lymphocyte Antigens (HLA). This policy outlines the matching algorithm rules used to identify and rank highly sensitized patients (HSP) who are potential matches to an available donor kidney.

Policy

1. Identifying Potential Recipient Matches

There are three tiers of matching and ranking that the HSP algorithm performs, to develop a final listing of potential HSP recipients for a deceased donor, who has been registered in the CTR. The three tiers are:

- Blood Group Compatibility
- HLA Compatibility
- Recipient and Transplant Program-specific filter

1.1 Blood Group Compatibility

1.1.1 Eligible potential HSP recipients are first matched for blood group compatibility, and then for HLA compatibility.

| Blood Group (ABO) Compatibility | |
|---------------------------------|------------------------------------|
| If donor blood group is: | Then recipient blood group can be: |
| O | O, A, B, AB |
| A | A, AB |
| B | B, AB |
| AB | AB |

1.2 HLA Compatibility

- 1.2.1 Potential matches are excluded when the donor has HLA antigens that have been listed in the potential HSP recipient’s record as being unacceptable.
- 1.2.2 Allele-specific antigens are identified by the algorithm and flagged for investigation, but do not screen out potential matches.

1.3 Recipient and Transplant Program/Agency Specific Filters

- 1.3.1 Optional filters can be applied by a transplant program/agency for the potential HSP recipients listed by that program, based on an assessment of the potential HSP recipient’s individual needs or preference(s) of the transplant program/agency.
- 1.3.2 The HSP matching algorithm will exclude potential matches based on filters entered for the specific potential HSP recipient. The following filters can be turned on or off and values can be added within specified ranges.

| Filter Attribute |
|--|
| Accept a donor up to a specified maximum age (<45, <55, <65, no restriction) |
| Accept a donor above a specified minimum age (>10, >11, >12, >13, >14, >15, >16, >17, >18, no restriction) |
| Accept a donor who has tested positive for Hepatitis B core antibody |
| Accept a donor who has tested positive for Hepatitis C |
| Accept a DCD (donation after cardio-circulatory death) donor |

2. Ranking of Matched Potential Recipients

2.1 If more than one potential HSP recipient is a match for a donor kidney, matches are prioritized based on the following ranking criteria.

| Matching/Ranking Attribute | Rank |
|---|------|
| Medical urgency | 1 |
| cPRA of 100% | 2 |
| cPRA of 99% | 3 |
| Paediatric (≤ 19 years of age) | 4 |
| Prior living donor | 5 |
| HLA match: The HLA typing for the donor and recipient indicates a zero out of six (0/6) mismatch for ABDR antigens | 6 |
| Kidney-pancreas | 7 |
| The donor and potential HSP recipient are in the same province | 8 |
| The donor and potential HSP recipient are in the same region: <ul style="list-style-type: none"> ▪ West region: BC, AB, SK, MB ▪ East region: ON, QC, ATL | 9 |
| Time on Dialysis (number of days starting at the most recent initiation of dialysis) | 10 |

2.1.1 Transplant Programs can list potential HSP recipients as Medically Urgent in CTR, if they are approved for and actively listed as Medically Urgent on a deceased donor waitlist by the local Transplant Program.

2.1.1.1 The potential HSP recipient's sponsoring physician submits data to document the factors that have resulted in the Medically Urgent status using, "Canadian Transplant Registry - Highly Sensitized Patient Medical Urgency Data Collection Form".

2.1.1.2 The "Canadian Transplant Registry - Highly Sensitized Patient Medical Urgency Data Collection Form" will be audited annually and as needed, by the Kidney Transplant Advisory Committee (KTAC).

2.1.2 There is no pre-emptive listing criterion for paediatric patients participating in the HSP Program.

- 2.1.3 The kidney-pancreas patient will receive a priority ranking score only in the event of an offer that includes the kidney with a pancreas.

3. Approval of HSP Allocation Methodology

The HSP allocation methodology, including the cPRA cut-off value, will be reviewed bi-annually by the Kidney Transplant Advisory Committee (KTAC) and the Organ Donation and Transplantation Expert Advisory Committee (ODTEAC).

| References |
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| <p>September, 2011, Reviewed at NKRAC February, 2012, Reviewed at ODTEAC March, 2012, Prior Living Donor change approved at NKRAC October 17, 2012, Reviewed at NKRAC. Request to change Kidney-Pancreas Patient to Kidney-Pancreas Offer. Canadian Blood Services to investigate. Canadian Highly Sensitized Patient and Living Donor Paired Exchange Registries: Task Force Discussion Document (October 2005) Assessment and Management of Immunologic Risk in Transplantation. A Canadian Council for Donation and Transplantation Consensus Forum Report and Recommendations (January 2005) Kidney Allocation in Canada: A Canadian Forum Report and Recommendations (February 2007)</p> |

| Version History | | |
|------------------------|-------------|--|
| Version | Date | Comments / Changes |
| V3.0 | Draft | Revised: 2.1 – inclusion of cPRA of 100% and cPRA of 99% to 2 nd and 3 rd rank based on decisions from KTAC (KTAC Minutes, May 15, 2015). Revised: 2.1.1 – replacement of Medically Urgent Approval process for a Medically Urgent Data Collection and Tracking process based on decisions from KTAC (HSP Medical Urgency Survey Responses, 2015-02-06). |
| V2.4 | 2013-02-27 | Remove: 2.2.1- unacceptable or not tested, add process for medical urgency determination expanded to reflect NKRAC |
| V2.3 | 2012-10-17 | Remove PRA cut-off from Matching; Expand HLA Compatibility, KP ranking, medical urgency |
| V2.2 | 2012-10-09 | Formatting and clarification of Filters and Ranking |
| V2.1 | 2012-09-07 | Reviewed at NKRAC F to F; no recommended changes |
| V2.1 | 2012-03-06 | Move Prior Living Donor to 3 rd ranking; Clarification and formatting; |
| V2.0 | 2012-06 | Reviewed at ODTEAC; recommendation to move Prior Living Donor to 3 rd rank |
| V2.0 | 2010-11-02 | Revised based on decisions from NKRAC (NKRAC Minutes, October 28, 2010). Changes include: <ul style="list-style-type: none"> ▪ Removal of the points for those moderately sensitized patients with a PRA of less than 80% ▪ Inclusion of time on dialysis from day one, in order to closer resemble the allocation methodologies in use locally for patients waiting for transplant. |
| V1.0 | 2009-10-28 | Original version |

Appendix A – Provincial/Territorial Sign-Off for v3.0

| Version | Jurisdiction | Clinical Authority | | | Administrative Authority | | |
|---------|------------------|----------------------|--|------------|--------------------------|--|------------|
| | | Name | Title | Date | Name | Title | Date |
| v3.0 | British Columbia | Dr. David Landsberg | Provincial Medical Director, Transplantation | 2016-05-02 | Edward Ferre | Provincial Operations Director | 2016-05-02 |
| v3.0 | Edmonton | Dr. Norman Kneteman | Director, Division of Transplantation | 2016-04-05 | Deanna Paulson | Executive Director, NARP & Transplant Services | 2016-04-05 |
| v3.0 | Calgary | Dr. Lee Anne Tibbles | Acting Medical Director, SARP, ALTRA | 2016-06-02 | Carol Easton | Executive Director, SARP, ALTRA | 2016-06-02 |
| v3.0 | Saskatchewan | Dr. Ahmed Shoker | Medical Director | 2016-04-11 | Carol Brown | Interim Director, SK. Transplant Program | 2016-04-06 |
| v3.0 | Manitoba | Dr. Peter Nickerson | Medical Director (TM-AKP) | 2016-03-14 | Kim Werestuik | Manager of Patient Care | 2016-03-14 |
| v3.0 | Ontario | Dr. Jeff Zaltzman | CMO TGLN | 2016-04-06 | Ronnie Gavsie | CEO TGLN | 2016-04-07 |
| v3.0 | Québec | Dr. Michel Carrier | Medical Director | 2016-05-25 | Louis Beaulieu | General Director | 2016-05-25 |
| v3.0 | New Brunswick | Dr. Robert Adams | Medical Director | 2016-05-02 | Mary Gatien | Director, Clinical Services | 2016-05-02 |
| v3.0 | Nova Scotia | Dr. Ian Alwayn | Surgical Head | 2016-06-16 | Victoria Sullivan | Director | 2016-06-20 |
| v3.0 | Newfoundland | Dr. Brendan Barrett | Medical Director, Kidney Program | 2016-04-15 | Janet Templeton | Regional Director | 2016-05-11 |