Scandiatransplant Acceptable Mismatch Program (STAMP) and Local Acceptable Mismatch Program (LAMP)

STAMP

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1. General STAMP guidelines

Purpose
To increase the likelihood of offering a suitable kidney graft to broadly sensitized recipients, thus reducing their time on the waiting list.

Acceptance criteria
1. Transplantability score (TS) ABO identical ≤ 2% and ABO compatible ≤ 3%
2. The last tested sample drawn less than 3 months before acceptance

Recipient HLA typing
Recipient HLA-antigens must be assigned at split level by molecular (and serology) typing.

Recipient acceptable HLA-antigens
Definition of acceptable HLA-mismatches is performed by laboratory at recipient center. Acceptable mismatches may be HLA-A, -B, -C, -DRB1, -DRB3/4/5, -DQA1, -DQB1, -DPA1, -DPB1 antigens. Acceptable mismatches may include repeated mismatches from previous transplantations, but should mainly reflect the current immunization and not historical antibodies. Definition of acceptable mismatches may be based on CDC and/or solid phase assays.

Wait listing and matching
Recipients own antigens and the defined acceptable mismatches are treated similarly. Recipients in the program must be regularly screened at least every 3 months, antibody specificities must be re-evaluated at least once a year. Once accepted, patients will stay included even if sensitization decreases.

For each donor search, a specific search among STAMP-recipients based on split level HLA, is performed. Exchange obligation is marked when the donor only has HLA-A, -B, -C, -DRB1, -DRB3/4/5, -DQA1, -DQB1, -DPA1, -DPB1 antigens specified as recipient’s own or acceptable. If there is more than one STAMP candidate when doing the search for kidney exchange obligations the recipients must be prioritised in the following order
1. Lowest TS, ABO compatible
2. ABO identical recipients
3. Same country as donor
4. Longest waiting time
The search result list is sorted by a calculated AMP-score, which is a weight score based on these priorities.

Re-evaluation by the steering committee
A STAMP patient not transplanted with a shipped kidney because of a positive cross-match must be temporarily withdrawn from STAMP, re-evaluated and eventually re-admitted.

Event reporting
Exchanged organ may be used for other local recipient if the indicated STAMP patient for any reason cannot be transplanted, reason must be recorded.

Recipient center must give detailed follow-up information on performed transplantations.

Steering committee:
The STAMP steering committee (SC) is a scientific subgroup of the Tissue Typers Group, which is an expert advising committee for the Nordic Kidney Group. SC shall be composed of one tissue typer from each of the countries within Scandiatransplant together with a clinical representative from each country represented in the Nordic Kidney Group. Proposals of STAMP candidates from individual centers must be evaluated and accepted by two of the tissue typers in the SC from which the candidate does not originate from. The evaluation by the SC is performed within four weeks from the date that recipient center has activated the patient for evaluation.

SC must keep updated on all effects of the program, including:
- Number of exchanged organs.
- Changes in waiting time for STAMP recipients and for other waiting patients.
- Changed reactivity in individual waiting recipients
- Positive cross matches at donor center.
- Fate of performed transplants.

SC must give yearly status reports to Scandiatransplant.

At the annual Scandiatransplant Tissue Typer Group meetings, individual cases on patients who have been waiting for years on the STAMP list can be brought up for discussion.

2. Finding the menu for entering STAMP-data

Enter patient identification (Scandia no. / date of birth) and press search
Click on the relevant patient on the search result list
Click on the active kidney waiting list entry (no information in the ‘Termination’ column):

Any patient with a kidney treatment record will have the STAMP tabs available.
3. Selection of patients

3.1 Potential candidates
Potential candidates can be found by entering the list from the menu entrance ‘Quality Control’ -> ‘Estimated TS ≤ 2% with no STAMP record’. This list contains patients that are highly sensitized and have antibody specificities recorded in the system.

3.2 Good candidates?
Evaluate if the potential STAMP eligible patient have difficulties in getting a kidney from a local donor.

- Good candidates usually have a reason for sensitization(previous transplants, pregnancies, or blood transfusions).
- Good candidates often have both CDC and solid phase reactivity.
- Good candidates usually have high-level reactivity in antibody testing.
- Good candidates occasionally have a history of positive cross matches.

3.3 Consult clinician
Consult clinician about the need for STAMP or any other type of prioritizing. Consider both STAMP and LAMP and decide what is best for the particular patient.

4. STAMP initial preparation

4.1 Registration of relevant HLA antibodies
A summary of all registered antibodies can be viewed in the ‘STAMP Aux’ tab.

Antibodies with () are no longer clinical relevant, these can be given by selecting them through the ‘Acceptable Antibodies’ tab on the recipient.
• Include all antibodies that are positive according to local rules (e.g. all with Luminex MFI level > 1000)
• If allele specific antibodies are detected, consider adding them at serological level if the allele is not extremely rare. Remember that you do not know ethnical background of potential donor beforehand!

4.2 Entering STAMP data

4.2.1 Determination method
Click on the field 'Determination method' and select one to many from the list

4.2.2. Acceptable mismatches
Acceptable mismatches are selected from the lists or entered one by one.

Deselect by clicking on the antigen specificity again

‘Select all’ will select all antigens on the list as acceptable mismatches
‘Select calculated’ will select all antigens that the recipient has no HLA antibodies against.

How to select antigens to be listed as acceptable mismatches (AMM)

• All antigens that the patient has no antibodies against could usually be added to the AMM list. These may also include possible previous mismatches.
  o If you add DR17 remember to add DR3 also.
  o If you add both Cw9 and Cw10 add Cw3 also.
  o Other broad serological level antigens may be added if all splits are on the AMM list, but usually are not necessary since laboratories type these at split level.
• Own known antigens cannot be added to the AMM list. Add most likely own (according to haplotype analysis) antigens to the AMM list if these are not typed and reported.
• If you have an allele specific antibody against patient own antigen (different allele) it is usually better to remove that antigen-with an explanation-from the patient typing

4.2.3 Date of acceptance
Date of acceptance is automatically inserted when the recipient has been accepted and ‘Sign up’ is changed to ‘Yes’.
4.2.4 Status
When you are preparing the patient set the status to Inactive/calculation

<table>
<thead>
<tr>
<th>Determination Method: CDC-LUMI</th>
<th>Date of acceptance: 17-Mar-2020</th>
<th>Status:</th>
<th>Sign up:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>A: Active</td>
<td>N: No</td>
</tr>
</tbody>
</table>

- **HLA-A:** A: 30, 31, 32, 33, 69, 74
- **HLA-B:** A: 5, 7, 12, 16, 17, 21, 22, 27, 35, 38, 41, 44, 45, 48, 49, 50, 51, 52, 55
- **HLA-Cw:** A: 4, 5, 15, 17, 18
- **HLA-DQ:** A: 10, 103

4.2.5 Comments
Write all relevant information in the comments field. At least the following information should be added:

- List of all detected allele specific antibodies that are not added at serological level to the antibody list.
- List of all antigens that are not included to the antibody or AMM list for any reason.
- All other relevant information that SC should know

**TIP!**
You can always start entering data on the patient—leave the patient—with status inactive and return to enter more data later.

5. Quality check of STAMP data
When all data have been entered on the patient a quality check must be performed. Go to the tab ‘STAMP QC’
The STAMP QC will give you an indication of the quality of the registered data.  
Green colour = quality check passed  
Red colour = quality check did NOT pass, mandatory according to the STAMP guidelines, please check and/or add explanation to comment field  
Orange colour = quality check NOT passed, please check and/or add explanation to comment field  

The STAMP check is a quality control and is meant as a help, it does not inflict with the activation of patients to STAMP. If you have an explanation of why criteria are not fulfilled, please enter it in the comment field.

The quality check and calculations are done on the following variables:

**TS, ABO identical <= 2% (obligatory to fulfil)**
Checks if the current ABO identical transplantability score is ≤ 2%

**TS, ABO compatible <= 3% (obligatory to fulfil)**
Checks if the current ABO compatible transplantability score is ≤ 3%

**HI PRA >= 80% at present**
Defines if the patient is highly immunized (PRA ≥ 80%) in last registered antibody screen test

**Most recent PRA < 3 months (obligatory to fulfil)**
Checks if the last registered antibody screen test is done on serum drawn within the last 3 months

**A, B, C, DR, DQ splits**
A check is done whether the recipient HLA-antigens are assigned at split level. A "*" in front of an allele indicates that the assigned HLA type contains a broad serological type. A "!" in front of an allele indicates that there is a broad genomic type.
Result of the QC check may be No, if so check carefully that the reason for No is something you have intended.

**Acc. mm. splits**
Checks if all acceptable mismatches are registered as splits
Result of the QC check May be No, if so check carefully that the reason for No is something you have intended.

**Id. antib. splits**
Checks if all identified antibodies are registered as splits
Result of the QC check may be No, if so check carefully that the reason for No is something you have intended.

**No identif. AB in Acc. mm.**
Compares one to one if any identified antibodies by mistake are given as acceptable mismatches.

**Consistent Sero/Geno HLA**
Compares the patient’s own serological and genomic HLA as it is registered in the database.
All HLA checked
Listing all antigens not given as own HLA antigens, acceptable mismatches or identified antibodies.
Result of the QC Check may be No. If so, check carefully that you have mentioned not to include some antigens and that you have explained reasons not to include some antigens (for instance if antigens are left out due to linkage or if these are considered as “grey zone”).

6. Patients being prepared for STAMP
Finding the patients being prepared for STAMP, enter the menu ‘All recipients’ and register the search parameters below (Status should be either Inactive or calculation)

7. Patients ready to go on STAMP
When you have done the quality check and you believe that sufficient data has been entered you have to change “Status” from I/C to A and save data.

An e-mail will now be sent to the committee and they will go through the patient to see if it is valid for the program. The results of the STAMP quality check will automatically be included in the email message.
Example of part of an email message

Scand 181  updated 2/4/2021 7:48:56 AM by       Not signed up, changed status to Active

Serological HLA: A2,11;B13,53;Cw4,6;DR7,13;DQ2,6;Bw4

Genomic HLA: A*0201,1101;B*1302,5301;C*0401,0602;DRB1*0701,1302;DPB1*0401,1701;DQB1*14

Identif. Antib.: A:1,23,24,(80)
B:(7),(8),(18),(35),(39),(41),(42),44,45,(46),(48),(49),(50),(54),(55),(56),(60),(61),(62),
(64),(65),(67),(71),(72),(75),(76),(78),(81),82
Cw:(1),(8),(10)
DQ:4,7,8,9
DQA:03,04,05
DR:1,4,(14),15,(18)

Calc. comb. PRA: 98

Acc. Mism.: A3,25,26,29,30,31,32,33,34,36,43,66,68,69,74,80
B7,8,18,27,35,37,38,39,41,42,46,47,48,49,50,51,52,54,55,56,57,58,59,60,61,62,63,64,65,67,71,72,
Cw1,2,5,7,8,9,10,12,14,15,16,17,18
DP0101,0201,0301,0402,0501,0601,0901,1001,1101,1301,1401,1501,1801,1901,2001,2301,2801
DPA03,04
DQ5
DR103,8,9,10,11,12,14,16,17,18
DRB3*01,3*02,5*01,5*02

TS <= 2%: Yes (.75%)

PRA < 3 months: Yes (18-Nov-2020 2 months 17 days)

8. Patients for evaluation

STAMP patients ready for evaluation is found by entering the ‘Quality Control’ menu and selecting ‘Candidates for evaluation’:
9. Communication during evaluation

Approval/disapproval and communication about each specific patient must be done on the related waiting list record in the ‘STAMP log’ tab. To add information in the table, click below the ‘Comments’ column header.

Each time information is added in the STAMP evaluation table an e-mail with updated information will be sent to the STAMP committee and persons working on the patient record.

10. Patients on STAMP

In the menu ‘All recipients’ enter the search parameters below and you will find all patients on STAMP. If you only wish to see patients belonging to a specific tx. center you can add it is as a search parameter.

11. Quality control of antibody screening

Patients on STAMP must be HLA antibody screen tested at least every 3 months. To ensure that all active STAMP patients complies with this rule go to the menu ‘Quality Control’ -> ‘STAMP - PRA older than 3 months’.
By entering this menu, you get a display of patients missing the regular antibody screen test. To the right is a count of months and days since last registered screen test.

- **STAMP** listed patients must be screened at least every 3 months, and antibody specificities must be re-evaluated at least yearly. However, it is obligatory to perform the AMM list re-evaluation immediately when you notice significant changes in patient’s immunization status, although the patient may have been previously evaluated less than a year ago.

- Add all new antibodies into the detected antibodies list and remove the same antigens from the AMM list. This does not necessitate steering group re-evaluation.
  - If the new antibody is allele specific, add it to antibody list at serological level if it is not extremely rare and remove the antigen from the AMM list. Information of very rare new allele specific antibody could be only added to the comments field without changing the AMM list.

- If your patient’s immunization status has improved, you may consider register previously detected antibodies as allowable antibodies and adding them into the AMM list.
12. Patients temporary off STAMP

After acceptance to STAMP, the center responsible for the patient, has the possibility to remove the patient temporary from the program (for instance after a positive X-match). If you want to do so, you have to change “Status” from A = Active to I = Inactive.

Please select cause of temporary withdrawal.

Note
The patient will of cause still be searchable in Kidney-search only the STAMP exchange obligation will be suppressed.

To find “Patients temporarily off STAMP”

Perform thorough re-evaluation of the case and change the antibody/ the AMM list accordingly
Write the information of all changes and your opinion of the reason for positive cross match into comments field. Finally change the status from I = Inactive to A = Active and the patient will be re-evaluated by the steering group.

13. Patients permanent off STAMP

Patients no longer eligible for STAMP, must be permanently withdrawn from STAMP.

Select cause from list of value and save data.
### 14. STAMP reports

#### 14.1 Patient STAMP details

When you have a STAMP-patient (active/on hold/withdrawn) on screen you can press the STAMP print button to display STAMP data on the screen.

A typical printout will look like this

```plaintext
SCANDIATRANSPLANT  stamp_details
Report produced: 09-FEB-2021 11:09 requested by user: Page 1

*--------------------------------------------------------------------------*
| STAMP details |
*--------------------------------------------------------------------------*

Scandianumber: 2044
Person number: F Female
Gender: S Sweden
Country: GO
Tx-Center: Dialysis/Treatment center: BQ MÅ-LNDAL, Dialysavd
Waiting list: KI Kidney
Date of entry on waiting list: 23-JUN-2020
Waiting list status: N Notified
Waiting for tx number: 1
Blood group: 0
Narrow HLA: A 2,29;B 63,51;Cw 14,15;DR 4,12;DQ 7,8;
Repeated mismatches: Ant
Id Screen Test: 24-OCT-2020 I% 98 CDC,FLOW II% 6 CDC,FLOW
01-JUL-2020 I% 93 FLOW,LUMI II% 0 FLOW,LUMI

Identified antibodies: A:1,3,11,23,24,32,36,43,66,80 B:7,8,13,18,27,35,37,38,39,41,42,44,45,47,48,49,50,54,55,56,59,60,61,62,64,65,67,71,72,73,75,76,77,78,81,82 Cw:2,4 D:R:11 DRB3/4/5:5*01

Date of entry on STAMP: 07-AUG-2020
Date of acceptance on STAMP: 13-NOV-2020
Signed up: Y Yes
STAMP status: A Active
Determination methods: LUMI
Acceptable mismatches: A25,30,31,33,34,68,69,74 B46,52,53,57,58 Cw1,5,6,7,8,9,10,12,16,17,18 DP0101,0301,0402,0501,0601,0901,1001,1101,1301,1401,1501,1701,1801,
```

15
1901,2001,2301,2801 DPA02,03,04 DQ2,4,5,6,9
DQA01,02,04,06 DR1,103,7,8,9,10,13,14,15,16,17,
18 DRB3*02,3*03,5*02

Comments:

Most recent PRA < 3 months No 24-OCT-2020 3 months 16 days
HI PRA >= 80% at present No HI Highly immunized
HI >= x2 > 3 months Yes samples over 19 months 4 days
A,B,Cw,DR,DQ splits Yes (All acc. mismatches are splits)
Acc. mm. splits Yes All identified antibodies are splits
Id. antib. splits Yes No identified AB in AM
No identif. AB in Acc. mm. Yes Consistent Sero/Geno HLA
Consistent Sero/Geno HLA Yes Consistent Sero/Geno HLA
All HLA checked Yes All identified antibodies are splits
First registered: 07-AUG-2020 xx
Last changed: 13-NOV-2020 xx

14.2 Reports

A variety of STAMP reports are available in Reports -> More..:

Selecting STAMP notifications or withdrawals

Reports
Done
Liver rotation log
Lung rotation log
Heart rotation log
More...

More reports
Choose report:
Recipient - Liver notifications or withdrawals
Recipient - Liver transplantation
Recipient - Liver-Kidney notifications or withdrawals
Recipient - Liver-Kidney transplantation
Recipient - Lung notifications or withdrawals
Recipient - Lung transplantation
Recipient - Notifications and withdrawals statistics
Recipient - Other organs notifications or withdrawals
Recipient - Pancreas notifications or withdrawals
Recipient - Pancreas transplantation
Recipient - Potential missing antibody screen test for patients on waiting list
STAMP - notifications or withdrawals
STAMP - transplantation information
Transplantation statistics
A: Notifications all STAMP patients
If you choose this report you will get all patients with a STAMP record. In other words, the report will contain patients that are: Preparing to go on STAMP, active/on hold on STAMP, transplanted, permanently withdrawn and dead.

N: Notifications only active on waiting list
Gives you patients with a STAMP record active/on hold in the specified period

PW: Permanent withdrawals from STAMP
This extraction contains patients permanent withdrawn from STAMP together with cause and date.

TW: Temporary withdrawals from STAMP
If you choose this report you will get a list of patients that have been temporary off STAMP along with cause and date.

W: Withdrawals
Consist of all patients with a STAMP record that have been permanent withdrawn from the main kidney waiting list.

Selecting STAMP notifications or withdrawals

If you choose this report you will get a list of patients transplanted while they we signed up on STAMP waiting list.

It is possible to do the extraction for a specific period just enter starting and/or ending date.
LAMP

15. Introduction

Purpose
This program is a local version of STAMP. At recipient search the patients are matched the same way as STAMP patients, due to defined acceptable mismatches. The program does not result in any exchange obligations between centers.

Acceptance criteria
Each center defines the acceptance criteria themselves and there is no approval for inclusion to the program from the committee, patients can go directly on LAMP.

16. Menus for entering LAMP-data and LAMP pre transplantation information

To create a new LAMP-record search forward the recipient the same way as described for STAMP point 2.
To find patients with an existing LAMP record you can search on patient ID or you can use the ‘Active on LAMP’ search option:

17. Patients ready to go on LAMP

Enter LAMP information in the dedicated tab and select ‘Yes’ when you want to activate the patient on LAMP:
18. Kidney search result LAMP

In the kidney search result screen a LAMP match will appear as a priority 6 match and marked with a 'L' in the STAMP status column.
19. Calculated combined PRA and transplantability

A donor pool, based on 2000 recently HLA typed deceased donors registered in Scandiatransplant, has been made. The pool forms the basis of the following calculations.

19.1 Calculated combined PRA

The calculated PRA is based on the antibody summary and is updated automatically when the list of identified antibodies is changed. Antibodies that are no longer clinical relevant and set as acceptable () are not included in the calculation.

This feature is accessible from two places:
1. From the ‘STAMP Aux’ tab
2. From the menu ‘All recipient’, make a query on the specific patient and enter the antibody screen test tab.
19.2 Estimated transplantability score

The estimated transplantability scores are based on the latest antibody screen test result where HLA specificities have been defined. HLA-antigens to which the patients has no antibodies against are regarded as acceptable mismatches. Based on split level HLA typing it gives you the percentage of donors in the pool which are ABO identical or compatible and have HLA split level antigens that are acceptable to the recipient (recipient HLA + Acceptable mismatches).

19.3 Transplantability score

The transplantability scores are based on split level HLA typing on the patient and defined acceptable mismatches. It gives you the percentage of donors which are ABO identical or compatible and have HLA split level antigens that are acceptable to the recipient (recipient HLA + Acceptable mismatches).
19.3 Normal match

‘Normal match’ is based on the patient HLA type and a ‘normal’ broad level A, B and DR match. It gives you the percentage of donors which are AB0 identical and have no mismatches on HLA broad level A, B and DR with the recipient, similar to a priority 2 kidney exchange obligation.