

Damu Salama: overview of the current situation

September-November 2025 visit

1. Aims of the visit

- *To meet the personnel working in the BMH Damu Salama, to understand and eventually supporting interactions among the Blood Bank, the Central Regional Damu Salama, the Laboratory of Hematology and the BMT and other BMH' units, involved in high level clinical and surgical programs.*
- *To ascertain the state of art of quality management in terms of new operating procedures and documents to be introduced.*
- *To verify the ongoing activities of:*
 - *Extracorporeal Photopheresis required for transplanted patients affected from acute or chronic graft versus host disease (GVHD)*
 - *Bone Marrow special processing procedures in case of ABO (major and minor) incompatibility between donor and recipient*
- *To check out that an efficient system should supply the Damu Salama with blood units, devices and reagents routinely employed or exceptionally required.*
- *To support the forthcoming upgrade in the Damu Salama activities.*

2. Visit Description

Personnel Interviewed

Merlikiad Mhozya MLT, Florentina Magesa Nurse, Edward Major MLT.

All interviewed were collaborative. Personnel is frequently overwhelmed with a broad range of activities in the field of blood banking, immunohematology and services to clinical and surgical units operating at the BMH.

Spaces

The Damu Salama is hosted in an independent building inside the BMH complex, at walking distance from the laboratory department, BMT and other units.

Mainly, activities performed in the Damu Salama are limited to blood donor management, blood collection, blood units processing and storage. Procedures of marrow manipulation or PUVA treatment of lymphocyte collections are not feasible at the BB due to logistic and environmental conditions. About 90% of immune-hematology tests are carried out in the hematology laboratory, section of the central BMH laboratory, by personnel from the Damu Salama and the Laboratory.

Composition of the rooms and activities carried out:

- **Main Direction Office**
- **Front Desk** at the main entrance
- **Consultation office** New donors enrollment and pre donation consultations are conducted in the an environment that guarantees privacy

- **Blood collection room** where the collection of whole blood units and platelets' aphaeresis are carried out
- **Blood working room** blood processing is carried out in this separate and equipped space.
- **Blood units storage room** According to National Health Regulations, validation tests on the collected units are sent to the Central Zone Blood Centre of Dodoma that has in charge the validation of the whole collection and the blood grouping of donors. Units waiting for the validation are separately stored in a dedicated fridge whose working temperature is continuously kept under control. Environment temperature and humidity conditions are recently been improved by the upgrading of the previously installed air conditioning system
- **Irradiator room** a separated and refrigerated room where blood units' irradiator is placed
- **Room dedicated to promiscuous activities** in the future should become equipped as processing room for special activities
- **Storage Room** closed and used for limited storage of devices and materials used in the Damu Salama

Instruments and equipment

Consultation Office:

- PC inter and intranet connected used for donors' exams, donation eligibility and blood units validation consultation

Donation Room:

- 4-6 donation couches occupied accordingly to the flow of donors
- 4 blood donation monitors
- 1 cell separator OPTIA Spectra Terumo available for several procedures:
 1. Platelet apheresis on donor's call
 2. Erythro-Exchange (EEX) in SCD or other patients
 3. Therapeutic Plasmapheresis
 4. Manipulation of stem cells collected in Bone Marrow *
 5. Collections of lymphocytes from peripheral blood to ECP purpose *

** Procedures from point 2 are carried out routinely but in "protected spaces", as ICU, Clinical Wards or the BMT unit, accordingly the type of procedure and the severity of the clinical status*

Processing Room:

- 2 refrigerated centrifuges
- 2 sterile connector
- 2 sterile tube sealer

- 1 platelet incubator and agitator. This equipment is not functioning at all to ensure the proper storage conditions. MUST BE URGENTLY REPLACED

Irradiation Room:

- Blood products X-irradiator (RADGIL-GILARDONI) placed in; platelets and PRC are irradiated for allotransplanted patients or appropriate cases, on request by BMT or other Units.

Others:

- UVA PIT system, used with ECP (Extracorporeal Photopheresis) purpose in case of refractory GVHD, is a closed, offline system to UVA irradiate Lymphocyte collection after addition of 8 Methoxypsoralen, at the moment placed in a BMT unit room

Present Activities

1. Blood products collection, in site and out reach
2. Whole blood separation into PRC, Plasma and Plts' enriched plasma
3. Blood products irradiation, on specific request
4. Blood products filtration by mean of bed-side filters, on specific request
5. Blood component and Platelets washing on specific request
6. Storage of locally harvested units and apheresis platelets
7. Units supply to the Laboratory of Hematology that receives all patients' transfusion requests and performs pre-transfusion and compatibility tests.
8. General management and sending to DKMS of HLA typing samples collected from families of SCD patients potentially candidate to allogeneic bone marrow transplantation
9. Collection of buccal samples for HLA typing

Quality Management

National Blood Service of Tanzania has published and updated Operating Procedures, Operating Instructions on every topic in the Transfusion and Immunohematology Medicine field. MLT *Florentina Magesa* is the Quality Manager : procedures, evidence recording sheets and eventual qualification documents are stored in specific files, kept in closets at the Damu Salama. Specific procedures on immunohematology issues and adherent to AABB Standards are recorded in the Hematology Laboratory.

3. *Damu Salama current situation assessment*

Strengths points

- National Informative system for Donors and Donations traceability currently in use
- Platelet apheresis collection
- Capability to separate whole blood.
- Capability to irradiate blood components
- Capability to filter blood components
- Automated Bone Marrow Erythrodepletion feasible
- EEX and ECP procedures currently run
- Good documental recording
- Imminent acquisition of a system for the automated execution of all immunohematology tests

Challenging results achieved in 2025 year

1. Management of Bone Marrow Transplant in ABO incompatible Donor and Recipient couple

This is a challenging issue and sometimes it might require the Graft manipulation or plasmapheresis procedures pre graft infusion in patients showing high Isoagglutinin's titration; in this regard, the isoagglutinin's research is mandatory for every ABO incompatible donor-recipient couple. When required, Graft manipulation, consisting in red cells depletion by manual or automatic procedures, is a really critical process. In real local conditions, manual red cells depletion is unaffordable due to the risks of losing stem cells and/or infecting the graft, but the automatic manipulation by the OPTIA Spectra machinery it is now feasible and can be carried out by the Damu Salama personnel that has been specifically trained, eventually supported onsite or at distance by expert consultants.

2. Management of Acute and Chronic Graft versus Host Disease after Bone Marrow Transplant with additional treatments beyond medication: ECP (Extracorporeal Photopheresis

According to international Guidelines on GVHD treatment, several ECP treatments are needed in case of post-BMT acute or chronic "graft vs host disease" whose response could be dependent from or partially resistant to standard immunosuppressive therapy. The off-line ECP consists of a previous collection of lymphocytes from the patient by the OPTIA Spectra machinery, then a rapid incubation of the harvest with the UVA sensitizing drug 8-Methossipsoralene, followed by the UVA irradiation in a special machinery, PIT UVA System, available at the BMH Damu Salama. The response rate in skin and intestine GVHD is usually good, provided that the treatment is started early. ECP procedures are not in particular demanding from a technical point of view and BMT nurses and Damu Salama technicians have received a complete onsite training. Now the procedures are feasible and regularly carried out in a cGVHD patient without particular troubles. Nevertheless, due to the infrequent request for these multi procedures, the management of the treatment may be

delayed due to the unavailability of ready to use devices and 8-MOP, all materials subject to expiry and locally kept in limited stocks. Finally, the ECP process validation should be advisable: at the moment the QC are not feasible, but future availability of flow cytometry, will make possible to perform simple tests on pre and post treatment samples.

Items to improve

- Overload of work and logistic troubles. Despite the good level of qualification of the personnel employed in the facility, nevertheless a true overload of work it is evident due in part to the lack of personnel and to the amount of work to carry out even outside the Damu Salama.

MEASURES EXTREMELY ADVISABLE

- a. A Physician, possibly hematologist, responsible of overall activities of blood banking, immunohematology and transfusion medicine, is urgently needed*
 - b. At least three new qualified technicians in blood banking and immunohematology issues should be added to the present staff to speed up and ensure the continuity of activities. In particular, the separation of the Immunohematology laboratory from the hematology laboratory should be really helpful to ensure the continuous and qualified presence of personnel 24/24 involved in pre-transfusion, transfusion activities and more advanced exams required from clinicians or useful to clarify unexpected laboratory results.*
 - c. Create a fully dedicated team to outreach collection of blood to increase the number of external collections, an indispensable source of blood units. In this way, it would be possible to maintain the continuous presence of technicians and nurses for 24/24 and 7/7 activities.*
- Equipment URGENT ACQUISITION of
 - New Platelets Agitator and Storing, to replace present one, not properly functioning and undersized for the number of platelets units kept under storage and to be distributed. The replacing is really urgent to adhere to international standards on blood components storage
 - Second OPTIA Spectra as backup machinery and in order to optimize availability for collection and therapy purposes.
 - Constant availability of blood collected from Volunteer Not Paid Donors to guarantee a continuous supply of blood products needed to ensure safe and fast transfusion therapy to all who are in need of blood. This is a specific task of the Central Zone Blood Centre of Dodoma, however, external campaigns to promote blood donation must also be sponsored by the peripheral collection centers. At the moment, the 90% of the units collected at the BMH Damu Salama come from VNPD, a significant target achieved in a couple of years. Nevertheless, about 700 out of the 6200 collected units in 2025 year, are replacing units: further efforts must be made to avoid this type of donation, universally defined as not really “safe” for the recipients.

Finally, a very serious issue concerns the extremely long validation time of the collected units by the Central Bank, institutionally responsible of this task. The delay has been ongoing since last year, making particularly difficult to manage the stored but not valid units and punctual and efficient blood delivery

- The availability of Phenotyped units for minor Red Cells antigens might reduce the waiting time for finding a compatible unit in case of alloantibodies detection in patients.
 - *This activity should be carried out at the Central Zone Blood Centre or at the Immunohematology Laboratory.*
 - *Next availability of an automated blood grouping system and its related reagents, will facilitate this activity, which can be addressed to phenotype an appropriate number of O and A Rh positive and Rh negative blood donors. Of course, donors' samples must be detected twice and confirmed results inserted in the donor file to be always usable.*
- Difficult supply of reagents to detect the specificity of alloantibodies in recipients of blood units or bone marrow or other second level tests: these tests are of capital importance and must be in use to reinforce safety of transfusion
 - *The difficulty should be overcome with the acquisition of the automated system for immunohematology detections*
- Improve the supervision of stocked materials to avoid both the permanence of expired devices in the store and the risk of incorrect counts of usable materials. Stock cards and informative system are employed at the general laboratory store of the BMH, but the management should be improved and periodic monitoring should be carried out by a person designated by the Damu Salama.
- Finalise analysis on hospital blood needing by the designed group study in particular by defining immunohematology patients' profiles aimed to optimize the work flow in the immunohematology laboratory and accurately forecasting of costs due to pre-transfusion diagnostics and special detection activities in the immunohematology laboratory.
- Interactions with the clinical unit BMT are regularly ongoing. However, it's strongly recommended strengthening communications by regularly planned meeting and by written forms or documents when required, to program in advance procedures or exams for special patients as in the following case
 - Patients and Donors in the transplant list: to ensure a recommended third party evaluation and facilitate the donor management by the Damu Salama, responsible of performing some pre-transplant exams and autologous blood collection in stem cells donors, the Donor eligibility process should be shared between the BMT Unit and the Damu Salama. A dedicated monthly or at convenience meeting should be highly advisable. The specific procedure "Donor and Recipient evaluation" is under revision
 - Alloimmunized subjects

- ABO incompatibility between Bone Marrow donor and recipient requiring the isoagglutinin's research test and special manipulation of the harvest before proceeding to the infusion
- Patients showing a refractoriness to platelets' transfusion
- Patients in need of EEX in preparation to BM transplantation or for clinical reasons. Of course a continuous exchange is required among Damu Salama and blood users to improve the service in terms of quality and time of delivery. In preparation of the new organizational and technical setup of the immunohematology laboratory, some modifications related to blood samples invoice and blood units withdrawal will be unavoidable and communicated to the personnel working of in and out patients clinics by means of several educational and informative sessions.
- Provide the Damu Salama with a room devoted to cell products manipulation or special management. Waiting for the availability of a new location, it should be identified a room with limited personnel entry, perhaps where the irradiator is allocated or the room devoted to promiscuous use, provided that it is kept at a continuously checked, cool temperature and humidity % and cleaned according special protocols. Of course an appropriate arrangement of furnishings should be provided as closets to protect devices and materials as well as a safety cabinet and at least a sterile sealer.
- Educational Courses open to personnel employed at In and Out patients clinics and wards, focused on Transfusion and immunohematology issues. Courses will be addressed to update the knowledge on rational use of blood as precious and potentially harmful therapy ensuring safety and security in blood component use and to align present modality of blood request and blood delivery to national guidelines from NBTS.

Dodoma, 14/11/2025

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