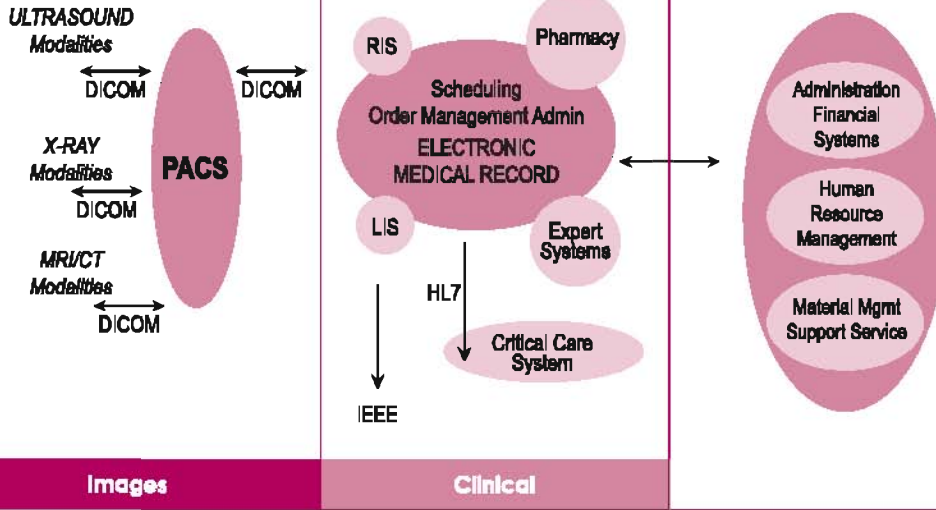


THIS STRUCTURE



BLOOD BANK INFORMATION SYSTEM

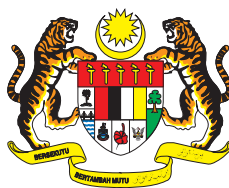
CLINICAL BASED

NON CLINICAL

Functional Requirements Brief Hospital Information System



Health Informatics Standards
Ministry of Health, Malaysia



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FOREWORD

Tan Sri Datuk Dr. Haji Mohd. Ismail Merican
Director General of Health, Malaysia

Malaysia being progressive in the adoption of Information communication “Technology in Health Care” has embarked in the creation of ICT enabled facilities. The Telemedicine blueprint “Leading Healthcare into Information Age” has laid the foundation for the planning and implementation of ICT initiatives in the country. Amongst the building blocks that has been recognised as vital for interoperability was the development and adoption of Health Informatics Standards.

The Ministry of Health has played a leading role in the development of Health Informatics Standards. In collaboration with stakeholders in the public and private sector, several standards have been developed for adoption in the country. Amongst them include the “Functional Requirements Brief” that has been prepared to provide functional requirements of the core business of the hospital as an entity. The business functional model including business functions, operational policies, high level work flows and system functionalities are well documented. This document would provide the health care personnel as to how the work processes and procedures are streamlined in a computerised working environment and for the system developers, it provides an in depth understanding of the user needs.

The documents that have been developed includes the

- Person Management System
- Pharmacy Information System
- Laboratory Information System
- Radiology Information System
- Blood Bank Information System
- Oral Health Information System
- Operation Theatre Management System

I wish this document be used as a generic standard in the development and customization of hospital information system being deployed in the hospitals in the country. I take the opportunity to congratulate the expert group that has put in countless number of man hours for the preparation of the document and all members of the consensus meeting for their participation and contribution.

TAN SRI DATUK DR. HAJI MOHD. ISMAIL MERICAN
DIRECTOR GENERAL OF HEALTH, MALAYSIA

VISION FOR HEALTH

Malaysia is to be a nation of healthy individuals, families and communities, through a health system that is equitable, affordable, efficient, technologically appropriate, environmentally-adaptable and consumer-friendly, with emphasis on quality, innovation, health promotion and respect of human dignity and which promotes individual responsibility and community participation towards an enhanced quality of life.

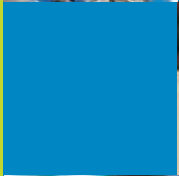
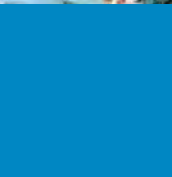
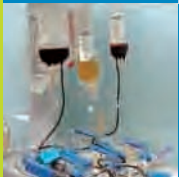
MISSION OF THE MINISTRY OF HEALTH

The mission of the Ministry of Health is to build partnership for health to facilitate and support the people to :

- Attain fully their potential in health.
- Motivate them to appreciate health as valuable asset.
- Take positive action to improve further and sustain their health status to enjoy a better quality of life.

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1. Introduction.

The Blood Bank Management Services consists of distinct functions as follows:-

- 1.1. Donor recruitment and management.
- 1.2. Blood procurement and management.
- 1.3. Production and distribution of blood and blood products.
- 1.4. Recipient management.

The Department provides services for the production and distribution of blood and blood products. The Department will function as regional centres for certain selected hospitals which will provide services for donor recruitment, blood procurement and management and the production of blood and blood products. For the smaller hospitals, such services will be provided through the regional centres and such hospitals will do recipient management function only.

2. Purpose.

The purpose of this document is to define the functional requirement of the Blood Bank Information System (BBIS), which is one of the core applications of the Hospital Information System (HIS). The document will be used for communicating the BBIS functions to both users as well as the application developers who will use it for defining the requirement specifications of the BBIS, which will then be used in the development of software application. However the scope and functionality defined in this document is generic; therefore individual hospitals should apply this document within the context of their business functions.

3. Objective:-

- 3.1. To provide online information flow for the management of blood donors and recipients.
- 3.2. To support the production, storage and issue of blood and blood products.

4. Scope:-

- 4.1. Blood Bank Information System will encompass the following functionality:-
 - 4.1.1. Blood donation management.
 - 4.1.2. Blood procurement.
 - 4.1.3. Blood safety.
 - 4.1.4. Blood and blood component production.
 - 4.1.5. Blood and blood component storage and distribution.
 - 4.1.6. Blood transfusion management.

4.1.7. Quality management.

4.1.8. Special services:-

4.1.8.1. Stem cell bank.

4.1.8.2. Histocompatibility and immunology.

4.1.8.3. Specialized platelet test.

4.2. System interface is required in LIS and CIS for the following functionalities:-

4.2.1. Orders for blood and blood products.

4.2.2. Lab orders.

4.2.3. Specimen tacking.

4.2.4. Order tracking.

4.2.5. Retrieve results.

4.2.6. Result charting.

4.3. Functional specification required for the management of Blood Bank is provided as follows:-

4.3.1. Work process involved in the management function.

4.3.2. System functionalities required to support the functions, including query tools.

4.3.3. Data output required for the reports.

4.3.4. Data input required in generating the report.

5. Methodology:-

5.1. The Business functional model for the BBIS was developed together with the laboratory group. The scope and functions of Blood Bank was developed by a group of haematologists and medical lab technologists with experience in blood banking and clinicians involved in using the blood bank services.

5.2. The experts analyzed the business functions by mapping the relationship between functions, work processes, and work flows. The operational policies and system functionalities to support the workflows were then developed.

5.3. Based on the mapping chart, the groups then develop the Business function model as follows:-

5.3.1. Business functions:-

5.3.1.1. Service product/scope.

5.3.1.2. Range.

5.3.1.3. Type of services.

5.3.1.4. Clients.

- 5.3.2. Operational policies.
- 5.3.3. High-level workflow.
- 5.3.4. System functionality.
- 5.3.5. Assumptions.

5.4. Functional Specifications:-

- 5.4.1. Work process.
- 5.4.2. System functionalities.
- 5.4.3. Data input.
- 5.4.4. Data output.

6. A consensus workshop amongst stakeholders in the Ministry of Health and subsequently with those in the private sector and industry was held to approve the business functional model.

1. Name of Service:- Blood Bank Services.
2. Business Function:-
 - 2.1. Service product / scope:-
 - 2.1.1. Recruitment & Blood procurement.
 - 2.1.2. Production and distribution of blood & blood products.
 - 2.2. Range:-
 - 2.2.1. Donor management.
 - 2.2.2. Product management.
 - 2.2.3. Recipient management.
 - 2.3. Type of services:-
 - 2.3.1. Blood Donation Management:-
 - 2.3.1.1. Public education & information.
 - 2.3.1.2. Blood donation campaign.
 - 2.3.1.3. Donor recruitment.
 - 2.3.1.4. Donor Records.
 - 2.3.1.5. 'Look Back & Recall' for seroconverted donations.
 - 2.3.1.6. Management for seropositive first time donors.
 - 2.3.2. Blood procurement:-
 - 2.3.2.1. Predonation counseling & Testing.
 - 2.3.2.2. Mobile / Centre.
 - 2.3.2.3. Apheresis Procedures.
 - 2.3.2.4. National Donor Registry.
 - 2.3.2.5. Donor Care.
 - 2.3.2.6. Donor incentives.
 - 2.3.3. Blood Safety:-
 - 2.3.3.1. Screen blood & blood products:-
 - 2.3.3.1.1. Microbiology / Immunoheamatology.
 - 2.3.4. Blood & blood component production:-
 - 2.3.4.1. Type of Components.
 - 2.3.4.2. Quarantine.

- 2.3.4.3. Fractionation.
 - 2.3.4.4. Release from quarantine.
 - 2.3.5. Blood & blood component storage and distribution:-
 - 2.3.5.1. Blood / Components / Products Inventory.
 - 2.3.5.2. Issue of Blood / components / Product.
 - 2.3.5.3. Recipient Records.
 - 2.3.6. Blood Transfusion Management:-
 - 2.3.6.1. Request:-
 - 2.3.6.1.1. Group & Cross Match, Group Screen & Hold, Maximum Surgical.
 - 2.3.6.1.2. Blood Ordering Schedule, Predeposit autologous transfusion.
 - 2.3.6.2. Patient Sample Processing.
 - 2.3.6.3. Selection and Issue.
 - 2.3.6.4. Recipient Data.
 - 2.3.6.5. 'Look Back & Recall' seroconverted recipients.
 - 2.3.7. Quality management:-
 - 2.3.7.1. Internal / External Quality Control.
 - 2.3.7.2. National QAP.
 - 2.3.7.3. Proficiency Testing.
 - 2.3.7.4. Audit.
 - 2.3.7.5. Surveillance.
 - 2.3.8. Special services:-
 - 2.3.8.1. Stem Cell Bank:-
 - 2.3.8.1.1. Collection / Stock inventory / Issue.
 - 2.3.8.1.2. Donor Database (International / National).
 - 2.3.8.1.3. Recipient Database.
 - 2.3.8.2. Histocompatibility And Immunology (H&I):-
 - 2.3.8.2.1. Tissue Typing:-
 - e.g. Human Leucocyte Antigen (HLA).
 - 2.3.8.2.2. Tissue Culture.

2.3.8.3. Specialized platelet test:-

2.3.8.3.1. Serology.

2.3.8.3.2. HLA.

2.3.8.3.3. Compatibility testing.

2.4. Clients:-

2.4.1. Internal Clients:-

2.4.1.1. Within the hospital – Clinical departments.

2.4.1.2. Within the enterprise care Service Network.

2.4.2. External Clients:-

2.4.2.1. Blood donors.

2.4.2.2. National Blood Bank Services Centre (Pusat Darah Negara (PDN)) / Other Government Hospitals / Public Health Clinics / Labs.

2.4.2.3. Private hospitals / Labs.

2.4.2.4. University hospital / Army hospitals.

3.1. Blood transfusion service:-

- 3.1.1. All blood donations shall be recorded in the LHR data.
- 3.1.2. A unique donation number shall be issued for every individual blood donation.
- 3.1.3. Crossmatching and immunohaematology services shall be provided 24 hours.
- 3.1.4. A Pathologist / Haematologist / medical officer shall be available for consultation or assistance at all times.
- 3.1.5. Regional blood centres and designated hospitals shall be responsible for donor recruitment, management and blood / blood components distribution to government, private care provider, maternity hospitals and other relevant health care providers.

3.2. Donor management:-

- 3.2.1. All blood donors recruited shall be healthy, voluntary and non remunerated.
- 3.2.2. Potential blood donors can be allowed to make on-line registration.
- 3.2.3. Access to the donor data shall follow access policy approved by PDN.
- 3.2.4. Blood donors shall be required to sign a donor enrolment form approved by MOH.
- 3.2.5. Donor acceptance and deferrals shall be made in accordance to acceptance & deferral criteria.
- 3.2.6. Exception for donor eligibility shall be modified upon consultation with the pathologist and / or medical officer.
- 3.2.7. All donations are subjected to mandatory testing using testing methods approved as defined by MOH.
- 3.2.8. All blood donor records and consent forms shall be archived permanently for medico legal purposes.
- 3.2.9. Upon completion of blood donation, the blood and blood products shall be checked and verified for donor identification and unique donation number and subsequently labelled.
- 3.2.10. All blood bags, pilot tubes shall be correctly labelled and matched against the unique donation number and bar coded.
- 3.2.11. All blood collected (complete / non-complete) shall be registered.
- 3.2.12. Donors found to be reactive to any infectious markers upon mandatory testing shall be called for counselling and further management in accordance to appropriate protocols.
- 3.2.13. Registered donors shall be allowed to go to any facilities linked online, for purposes of counselling, vaccination and subsequent management.
- 3.2.14. All the donated blood found to be reactive to the screening test for Anti HIV and Anti-Hepatitis C, the blood samples shall be sent to Pusat Darah Negara for confirmation.
- 3.2.15. National Blood Donor Registry includes:-
 - 3.2.15.1. Normal Blood Groups.
 - 3.2.15.2. Rare Blood Groups.

3.2.15.3. Permanent deferral list.

- 3.2.16. Blood Donation Centre in the hospitals, shall be responsible for maintaining the Blood Donor Registry. Amendments shall be made by authorized personnel only. PDN will be responsible to maintain National Blood Donor Registry.
- 3.2.17. Donor incentives shall be provided in line with the existing policies and guidelines of MOH. These shall include:-

3.2.17.1. Vaccination Programme.

3.2.17.2. Donor Status Verification Letters.

3.3. Blood Safety:-

- 3.3.1. Mandatory pre-donation counselling and screening shall be provided to all recruited donors.
- 3.3.2. Unique donation number system shall be defined and monitored / controlled by PDN.
- 3.3.3. All blood / blood components shall not be released and shall be subjected to quarantine until the results are verified and validated as per approved procedure.
- 3.3.4. All infected blood / blood components, shall be disposed as per procedure approved by MOH.
- 3.3.5. Transfusion of unscreened blood/blood components in emergency situations shall be in accordance to the current guidelines by MOH.

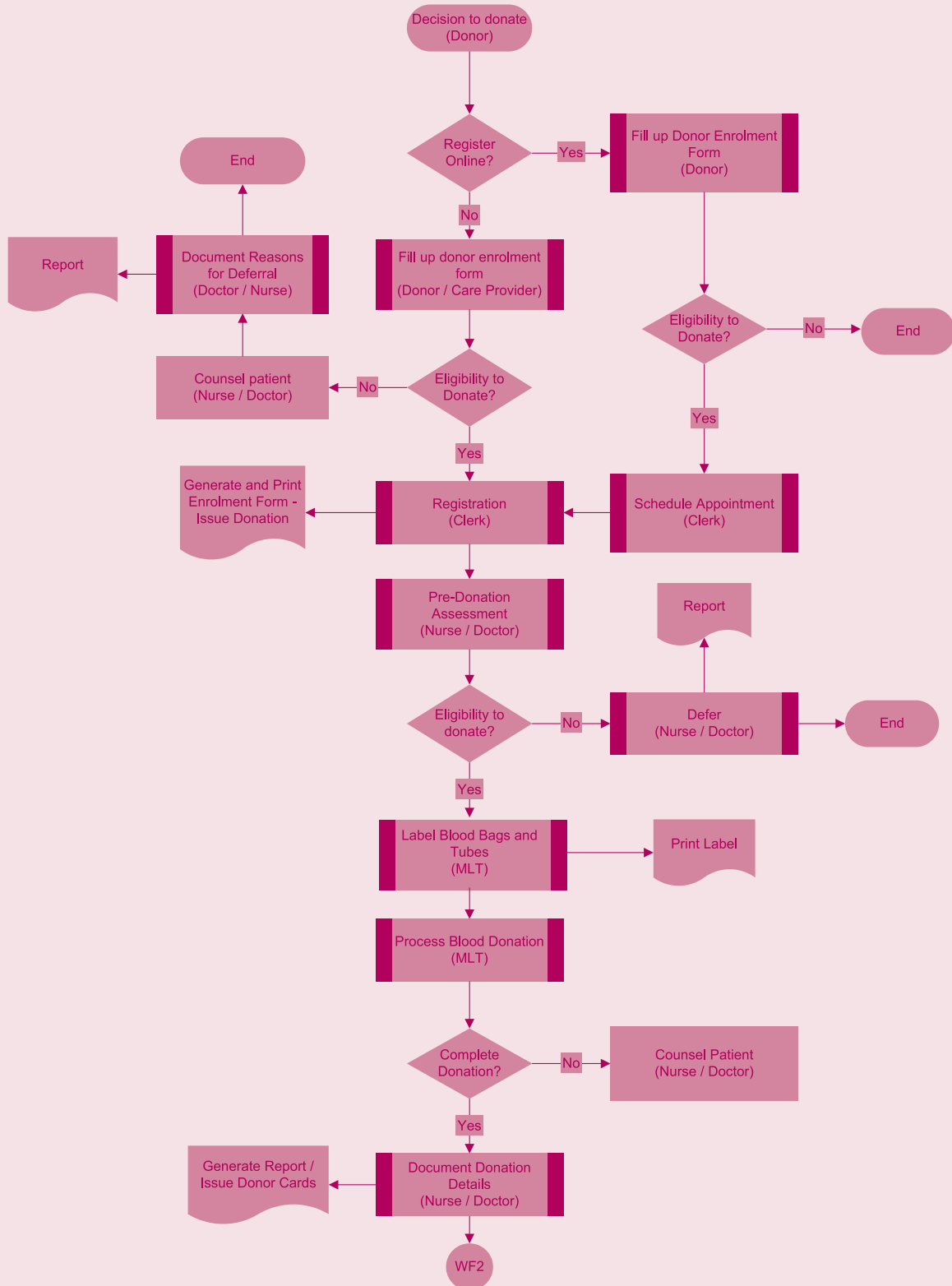
3.4. Recipient management:-

- 3.4.1. Requests for blood transfusions shall be made in accordance with Transfusion Practice Guidelines of MOH.
- 3.4.2. Pathologists / Haematologists /medical officers in charge shall be given limited access to patients' electronic medical records (EMR).
- 3.4.3. The requesting doctor shall ensure that the request order is adequately and correctly filled.
- 3.4.4. The requesting doctor shall ensure that the specimen is correctly labelled.
- 3.4.5. All emergency / urgent specimens shall be sent directly to the cross matching laboratory.
- 3.4.6. All specimens received shall be registered.
- 3.4.7. All tests subcontracted to another lab shall be accompanied by adequately filled request forms.
- 3.4.8. Requests for tests under special services (ref.2.3.8) shall only be made by a specialist.
- 3.4.9. Rejections of urgent specimens shall be notified immediately through telephone and recorded.
- 3.4.10. A new request shall be made for all rejected requests and specimens.
- 3.4.11. An order request can be modified upon consultation with the requesting doctor.
- 3.4.12. All specimens shall be stored for a minimum of 7 days from the date of receipt.

- 3.4.13. Consensus shall be developed and continuously updated on non-acceptance criteria for requests and specimens.
 - 3.4.14. The ward staff shall check the status of the request orders at least twice a day i.e. am / pm.
 - 3.4.15. The requesting doctor shall be responsible for reviewing the order outcome.
 - 3.4.16. All routine immunohaematology tests shall be validated by MLTs unless otherwise specified.
 - 3.4.17. Other reports for special tests (e.g. HLA) shall be validated by pathologist / scientific officer.
 - 3.4.18. All charges shall be made only after validation of results.
 - 3.4.19. All recipient records shall be archived online for a period of 3 years from the date of reporting and archived database for 10 years and microfiche storage permanently.
 - 3.4.20. Requests for test received during system down time, shall be sent back to the ordering department to be updated into the CIS as per local policy.
 - 3.4.21. Results obtained from subcontracted labs, shall be entered into LIS and verified on behalf of the referral institution, by authorized lab personnel, for clinicians to view in the patient's EMR.
 - 3.4.22. The MLT may be allowed to make order requests on behalf of doctors from external referring institution. Such orders shall be co-signed by the doctors / scientific officers in the lab.
 - 3.4.23. All transfused blood bags shall be returned and stored at the blood bank for 7 days.
 - 3.4.24. All recipient cards shall be returned to the blood bank.
 - 3.4.25. Transfusion details shall be recorded by nursing staff managing the recipient.
 - 3.4.26. All confirmed adverse reactions shall be reported to the National Blood Centre immediately.
- 3.5. Management Report:-
- 3.5.1. The respective hospital / facility shall be responsible for preparing and sending 'Error Management Report' to PDN whenever error has occurred.
 - 3.5.2. Hospitals shall be responsible for sending reports on collection, production and usage of blood / blood components to PDN monthly.
 - 3.5.3. Hospitals shall be responsible for sending monthly statistics on mandatory screening tests to PDN.
- 3.6. Transfusion Management:-
- 3.6.1. Request for blood transfusion shall be in accordance to the National Guidelines & Local Policy (e.g. Maximum Surgical Blood Ordering Schedule).

- 4.1. High Level Workflow for Processing Blood Donor.
- 4.2. High Level Workflow for Processing Blood / Blood Products.
- 4.3. High Level Workflow for Managing Blood and Blood Product Inventory.
- 4.4. High Level Workflow for Processing Transfusion Microbiology Test.
- 4.5. High Level Workflow for Management of Reactive Samples.
- 4.6. High Level Workflow for Management of Discarded Blood / Blood Products.
- 4.7. High Level Workflow for Processing Test Request in Blood Bank.
- 4.8. High Level Workflow for Processing Group, Screen and Hold (GSH) and Cross-Match (XM) Test Request.
- 4.9. High Level Workflow for Processing Cross-Match Test.
- 4.10. High Level Workflow for Processing Request for Blood / Blood Product Supply.

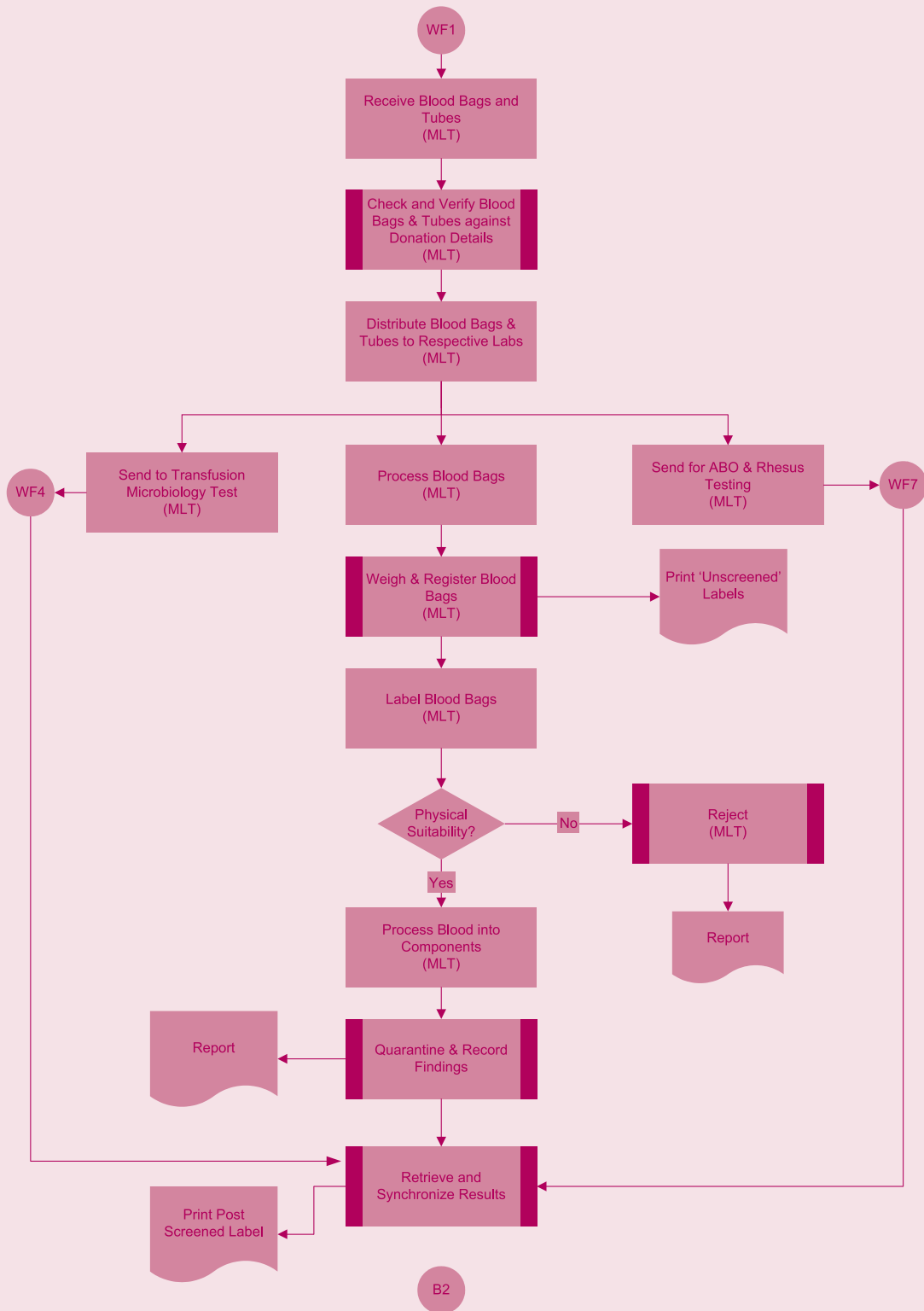
4.1. HIGH LEVEL WORKFLOW FOR PROCESSING BLOOD DONOR BBIS/WF/1

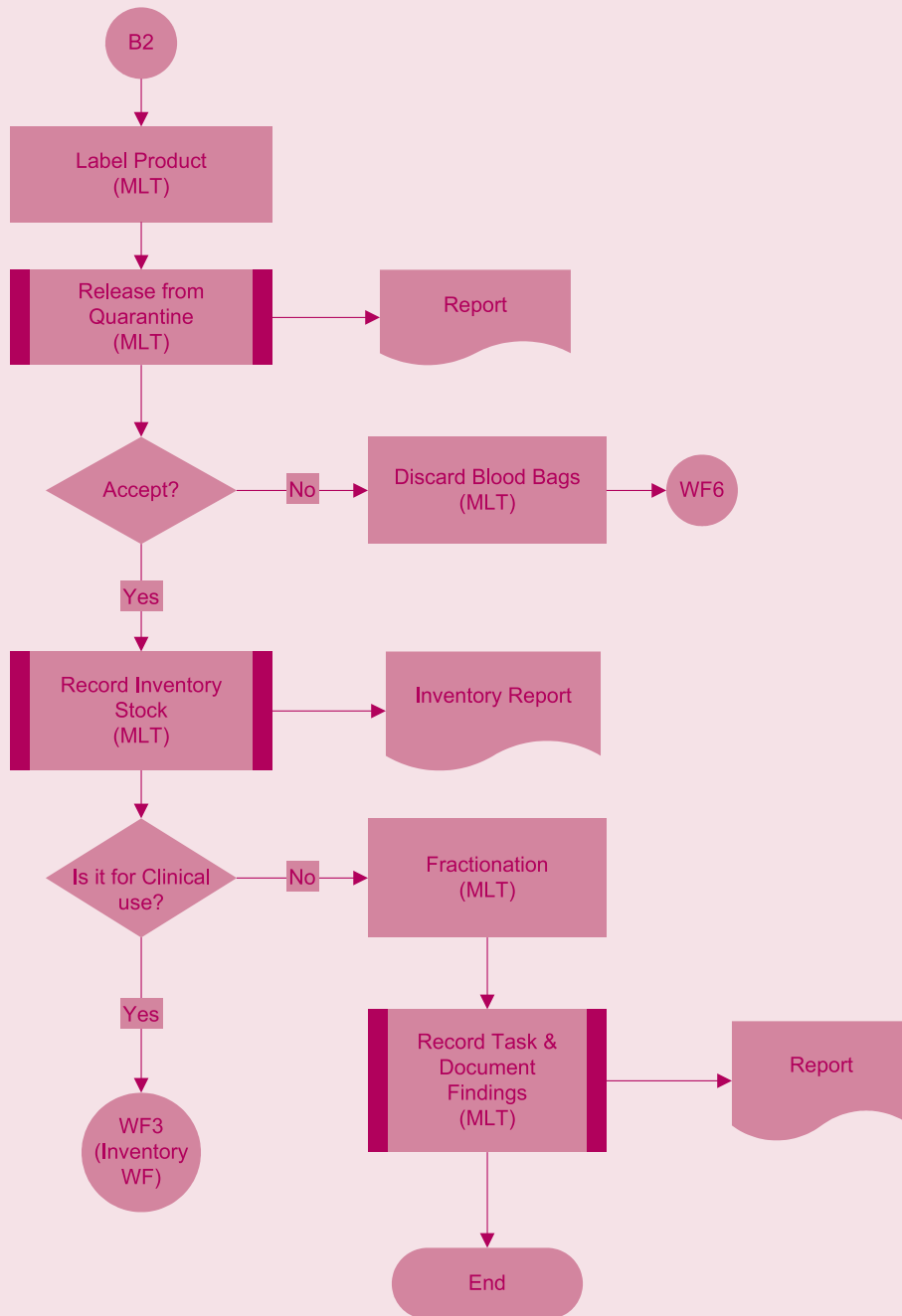


HIGH LEVEL WORK PROCEDURE FOR PROCESSING BLOOD DONORS BBIS/WP/1

1. This work procedure is applicable for processing request from an individual to donate blood. It is applicable for requests made online or where the individual presents physically to a hospital. It is not applicable for processing donor request in a mobile Blood Donation Campaign.
2. When an individual makes a decision to donate blood, he can make the request either on line or he could go to the hospital blood bank.
3. If he/she decides to register online, an online donor enrolment form has to be completed and submitted to the Blood Bank. If the person is not eligible for the blood donation, he/she will be advised to do the Health Risk Assessment (HRA) and follow the advice accordingly. If he/she is found to be eligible, an appointment will be scheduled for the individual to go to the hospital for the blood donation.
4. If the individual goes to the hospital blood bank directly, he/she will be required to fill the enrollment form. The registration clerk will review the form to check the eligibility of the individual to donate the blood based on predetermined criteria. If the individual is found to be not suitable, he/she will be referred to the nurse/doctor for counselling. The nurse/doctor will see the patient, counsel him/her and document the reasons for deferral. This information will be updated in the system.
5. If the person is found to be eligible, the clerk will register the patient and print the enrollment form. The individual will then be referred to the nurse for pre donation assessment.
6. Upon assessment, the nurse will check whether the person is eligible based on physical assessment findings. If the individual is not eligible, the nurse will counsel the person and document the reasons for deferral, which will be updated in the system.
7. If the person is eligible, the person will be requested to proceed to the blood donation area where the MLT will label the blood bags and tubes and process the donation.
8. If the donation is not completed, the person will be counselled by the nurse/doctor and sent home.
9. If the donation is completed, the MLT will document the donation details, label the bags, issue donor cards and send the person home.
10. The labelled bags and tubes will be sent for processing blood/blood products.
11. See BBIS/WP/2.

4.2. HIGH LEVEL WORKFLOW FOR PROCESSING BLOOD / BLOOD PRODUCT BBIS/WF/2

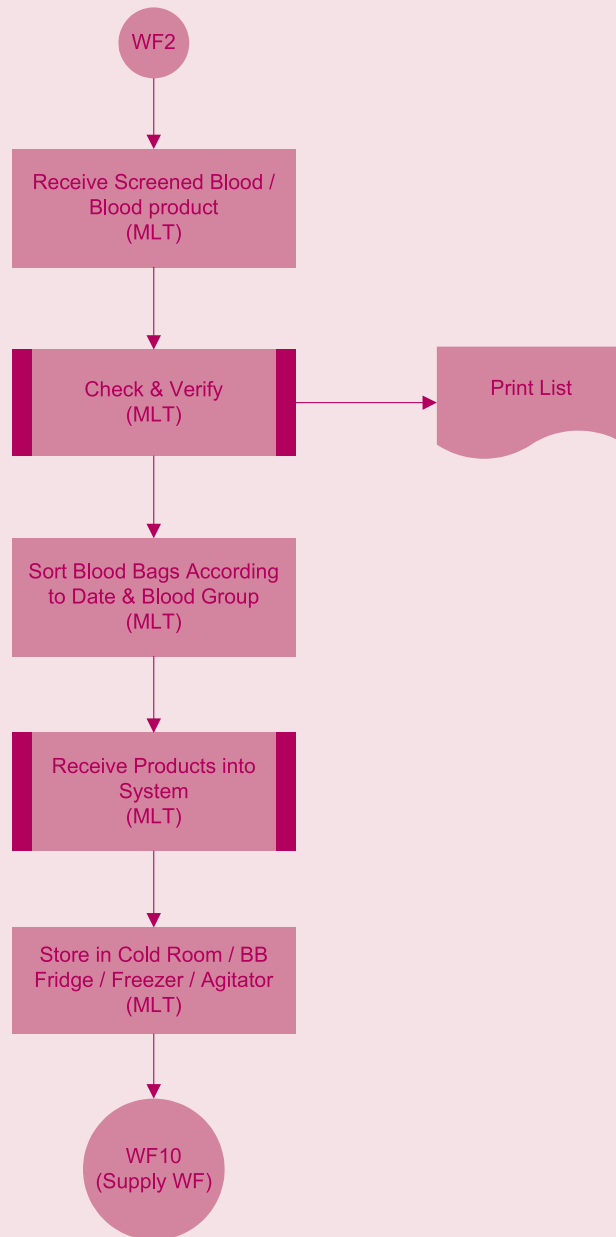




HIGH LEVEL WORK PROCEDURE FOR PROCESSING BLOOD AND BLOOD PRODUCTS BBIS/WP/2

1. This high-level workflow is applicable for processing blood and blood products after the donation is completed. This is applicable for blood collected at the blood bank and during the mobile drives.
2. The MLT will receive the blood bags and tubes from the bleeding station or from mobile drives. Upon receiving the blood bags and tubes, the MLT will check and verify the blood bags and tubes against the donation details.
3. The MLT will then distribute the bags for:-
 - a. Processing.
 - b. ABO & Rh testing Refer BBIS/WP/7.
 - c. Transfusion microbiology testing. Refer BBIS/WP/4.
4. The MLT will weigh and register the blood bags. Upon registration, he/she will check for physical suitability.
5. If found not suitable, the blood will be rejected, report generated and the blood will then be discarded. Refer BBIS/WP/6.
6. If found suitable, the blood will be processed into components.
7. Upon completion of processing, the blood will be stored in quarantine and a report generated.
8. The results of the transfusion microbiology and the ABO & Rh compatibility will be retrieved and synchronized.
9. The MLT will now label the product, release the product from the quarantine and produce the report.
10. Upon release from the quarantine, the MLT will again check the suitability of the blood to see whether it can be accepted. If the blood cannot be accepted, he/she will reject and send it to be discarded. Refer BBIS/WP/6.
11. If the blood is found to be acceptable, the MLT will record in the inventory stock. A report will be produced.
12. If the blood is not meant for clinical use, the MLT will send the blood for fractionation and record the findings.
13. If the blood is meant for clinical use, the MLT will enter it into the inventory list for supply. Refer BBIS/WP/3.

4.3. WORKFLOW OF MANAGING BLOOD AND BLOOD PRODUCTS INVENTORY BBIS/WF/3

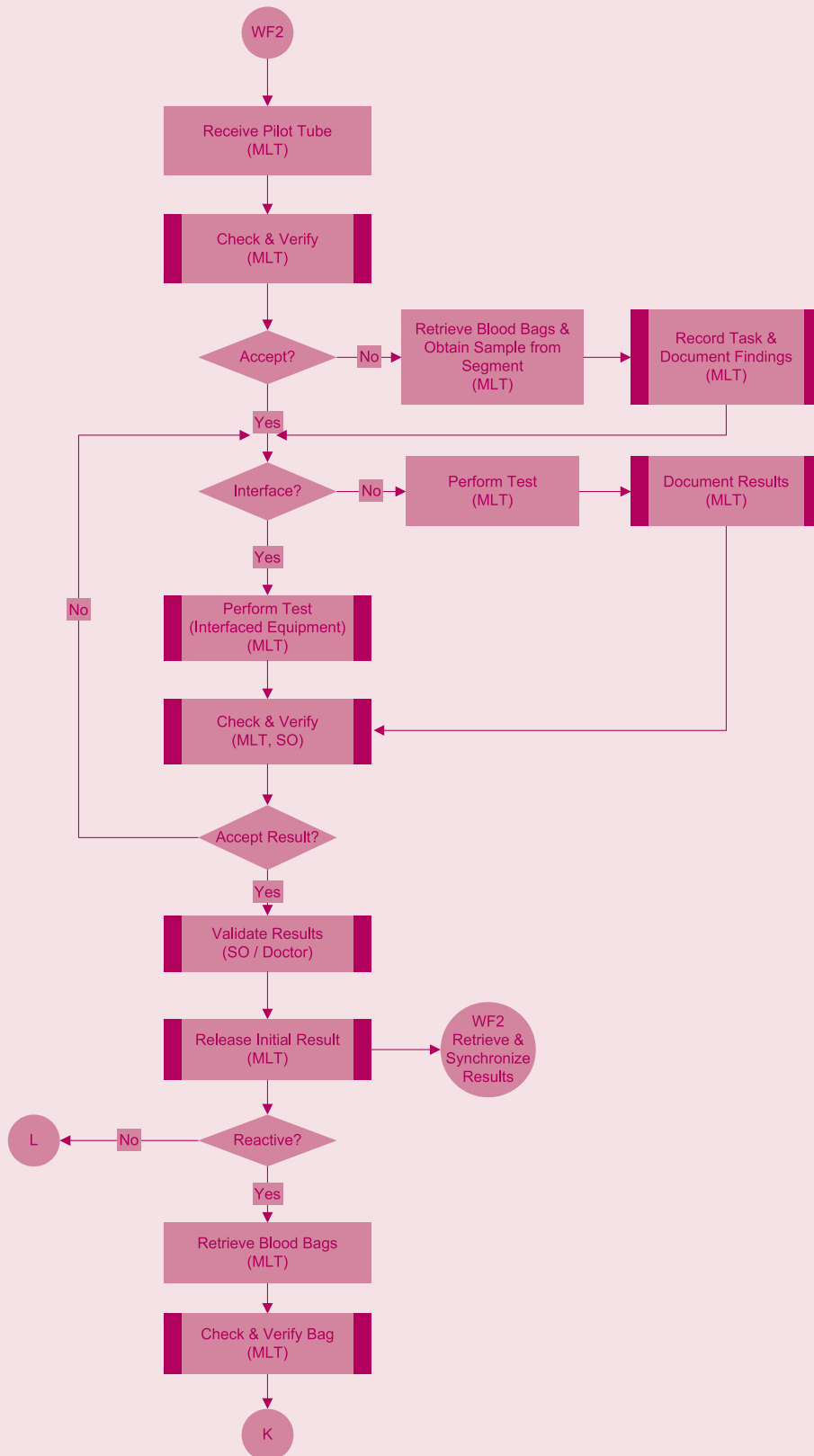


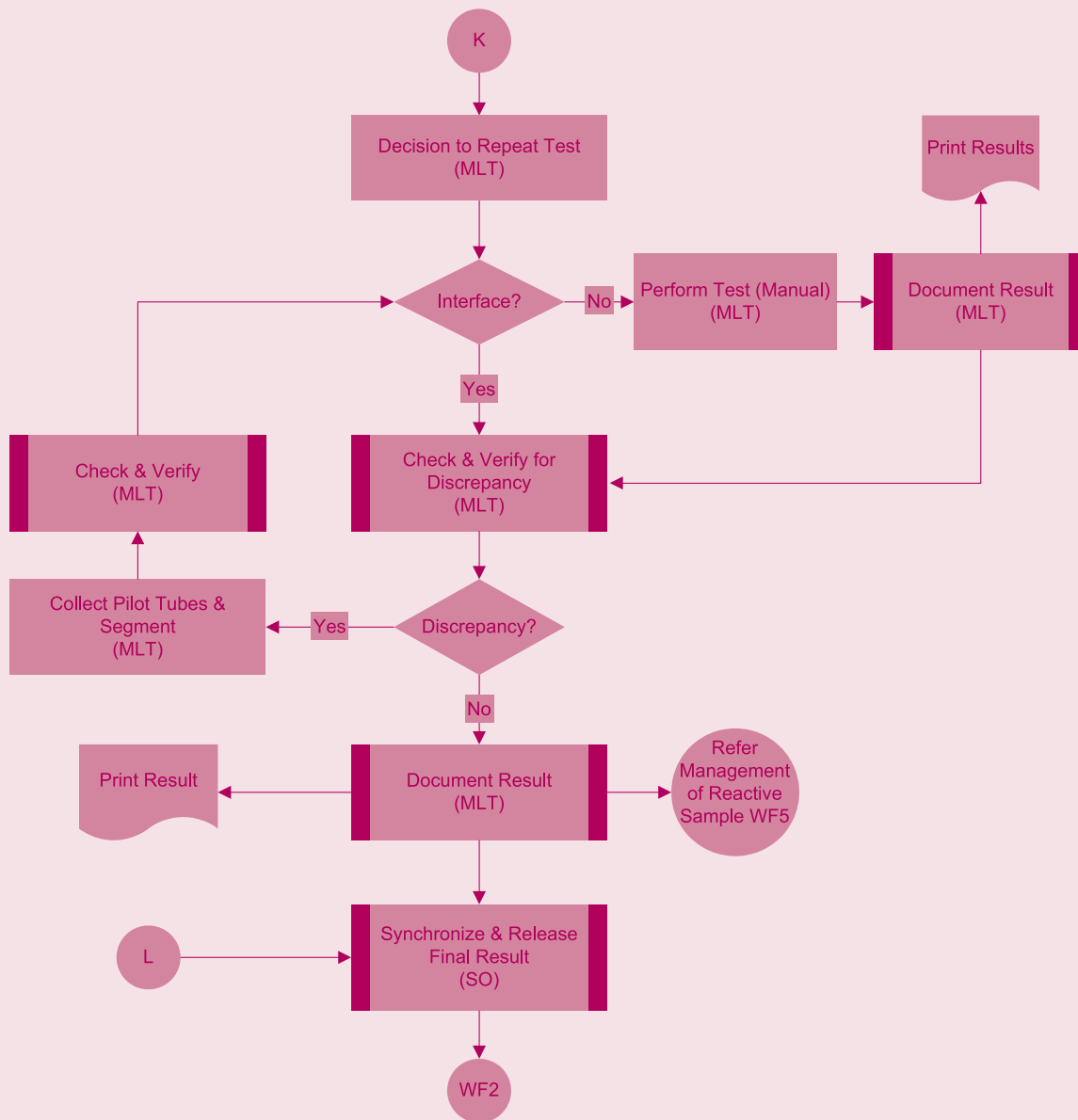
HIGH-LEVEL WORK PROCEDURE FOR MANAGING BLOOD AND BLOOD PRODUCTS INVENTORY

BBIS/WP/3

1. This high-level work procedure is applicable for the management of blood and blood products inventory. It is applicable for all regional blood banks responsible for the production, storage and supply of blood and blood products.
2. The MLT will receive the processed blood meant for clinical use. Refer BBIS/WP/2.
3. Upon receiving the blood and blood product, the MLT will check, verify and print the inventory list.
4. He/she will sort the blood bags according to date and blood group and receive the products into the system. The blood bags will be stored in the cold room/BB fridge/freezer/agitator pending supply. Refer BBIS/WP/10.

4.4. HIGH LEVEL WORKFLOW FOR PROCESSING TRANSFUSION MICROBIOLOGY TESTS BBIS/WF/4

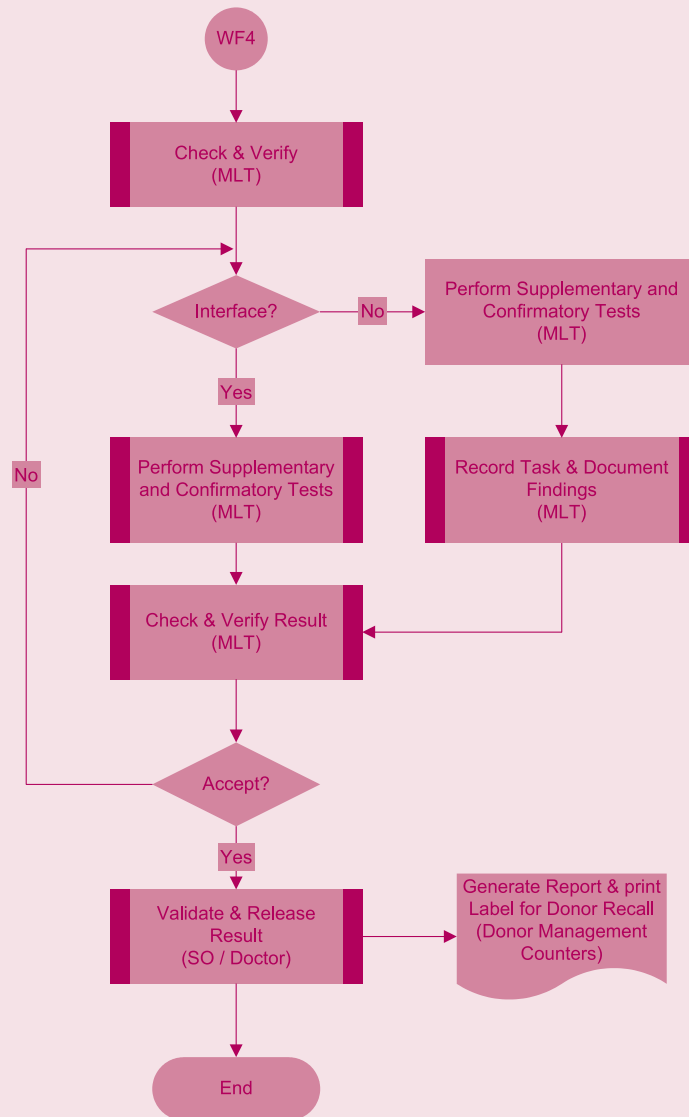




HIGH LEVEL WORK PROCEDURE FOR PROCESSING TRANSFUSION MICROBIOLOGY TESTS BBIS/WP/4

1. This high-level work procedure is applicable for processing transfusion microbiology tests following distribution, after the collection of blood from the donors. Refer BBIS/WP/2.
2. The MLT will receive the pilot tube from the donation area. He/she will check and verify the tube. If the tube is not acceptable, he/she will retrieve blood bags and retrieve the samples from the segment. The MLT will record the task and send the sample for testing.
3. If the sample is acceptable, he/she will send the sample for testing. If the test is performed using in equipment with no interfacing, the test will be done manually and the result will be documented.
4. If the test is performed in interfaced equipment, it will automatically perform and results recorded.
5. The MLT/SO will check and verify the results. If the results are not acceptable, the test will be repeated.
6. If acceptable, the results will be verified by the SO/doctor.
7. Upon validation, the initial results will be released for synchronizing before releasing the product from quarantine. Refer BBIS/WP/2.
8. The results will be checked whether it is reactive. If the result is not reactive, it will be synchronized with the product and the final result will be released.
9. If the results are reactive, the blood bags will be retrieved, checked and verified.
10. The MLT will then make a decision to repeat the test and raise the order.
11. The test will be performed either manually or with interfaced equipment, depending on the availability of the equipment.
12. The result will be verified for any discrepancy. If there is any discrepancy, the pilot tubes and the segment will be collected, checked, verified and the test will be repeated.
13. If there is no discrepancy, the final result will be synchronized with the product and will be released.
14. Upon release of the result, the sample will be managed as per BBIS/WP/5.
15. The product will continue its process as per BBIS/WP/2.

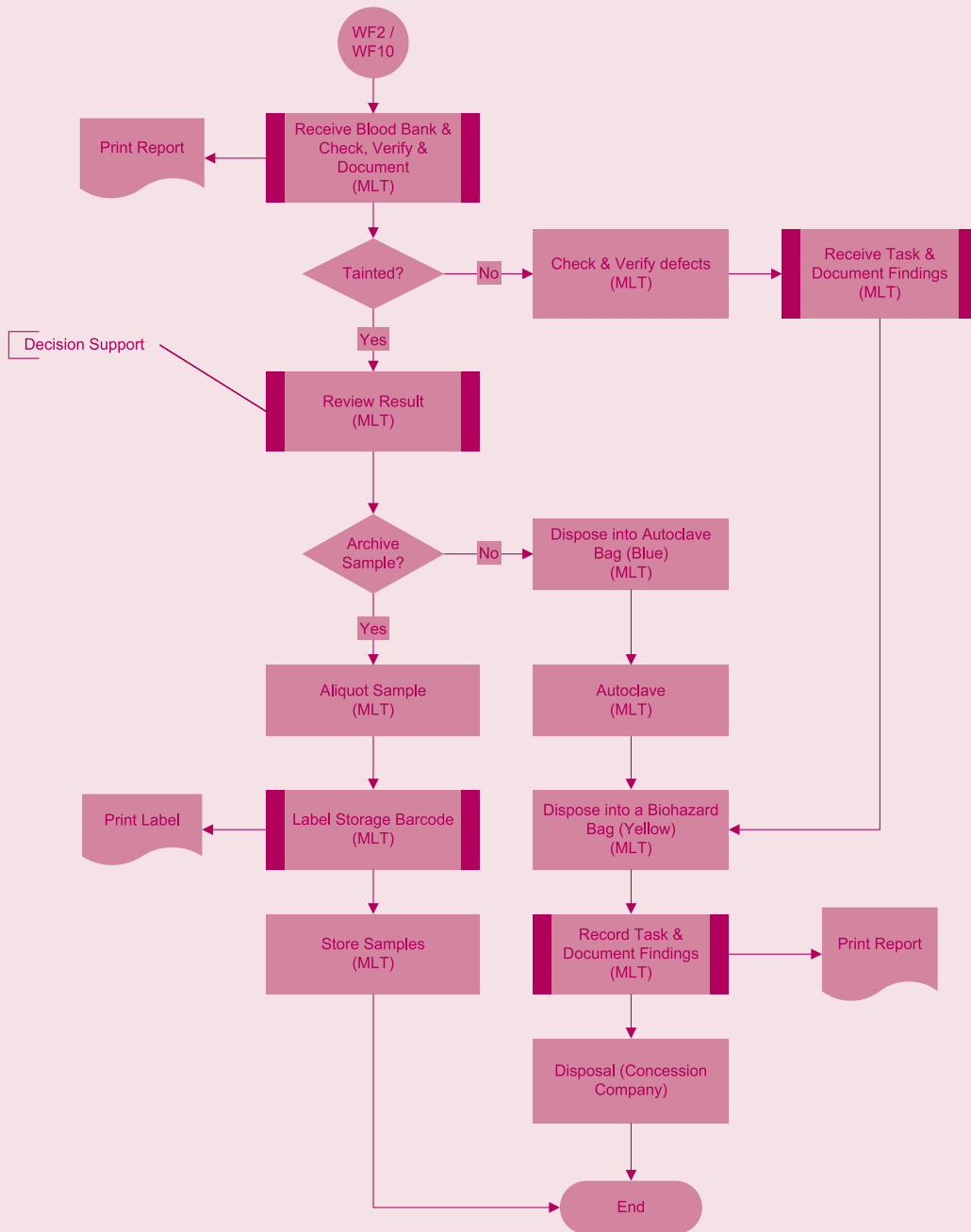
4.5. HIGH LEVEL WORKFLOW FOR MANAGEMENT OF REACTIVE SAMPLES BBIS/WF/5



HIGH LEVEL WORK PROCEDURE FOR THE MANAGEMENT OF REACTIVE SAMPLES BBIS/WP/5

1. This high-level work procedure is applicable for the management of reactive samples subsequent to its conformation as per BBIS/WP/4.
2. Upon receiving the reactive sample, the MLT will check and verify the sample.
3. He/she will perform the supplementary/confirmatory tests either manually or with interfaced equipment depending on the availability of the equipment.
4. He/she will check and verify the result to see whether it is acceptable. If not acceptable, the test will be repeated again.
5. If acceptable, the SO/doctor will validate and release the result. A report will be generated and donor recall will be processed.

4.6. HIGH LEVEL WORKFLOW FOR MANAGEMENT OF DISCARDED BLOOD / BLOOD PRODUCTS BBIS/WF/6

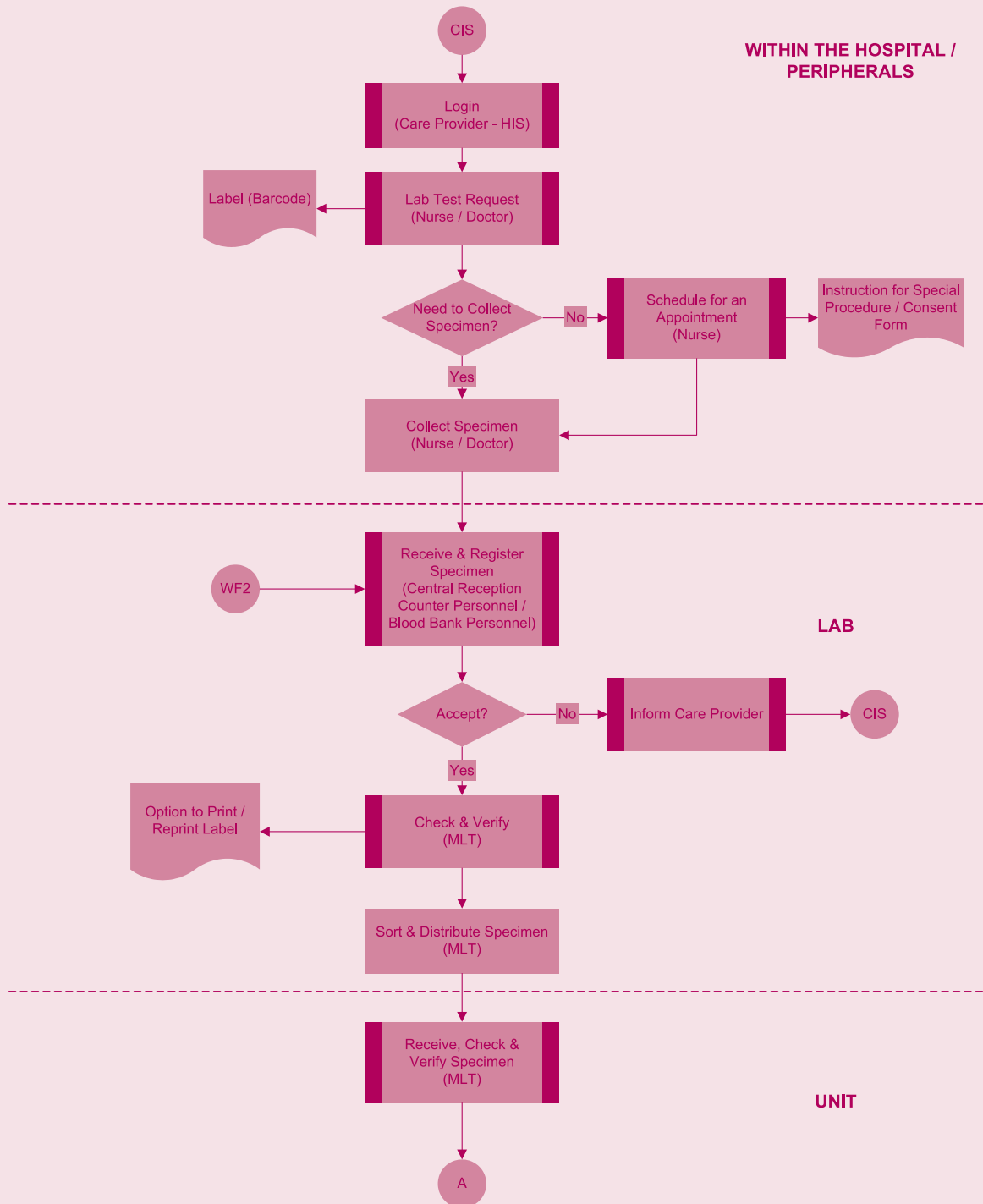


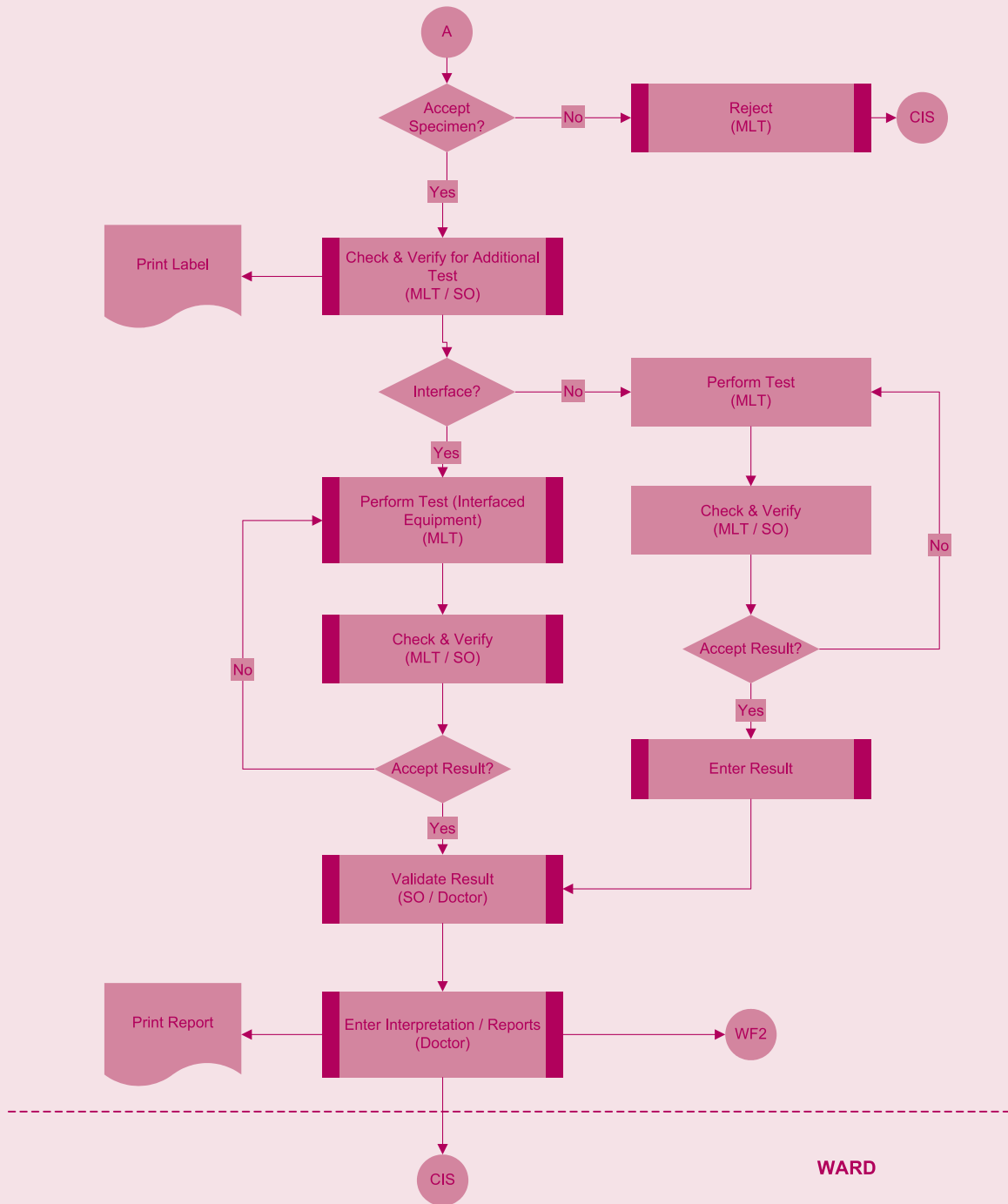
HIGH LEVEL WORK PROCEDURE FOR MANAGEMENT OF DISCARDED BLOOD/BLOOD PRODUCTS

BBIS/WP/6

1. This high-level work procedure is applicable for the management of discarded blood and blood products. The products may be discarded in the blood bank at the time of processing the blood and blood products, refer BBIS/WP/2. It may also be discarded in the ward prior to transfusion, when it is found to be not acceptable for transfusion. Refer BBIS/WP/10.
2. The MLT will receive the discarded blood bags, check and verify them with the documents.
3. He/she will check whether the blood is tainted. If it is not tainted, he/she will check the defects as documented and record the findings and dispose the blood bag into the biohazard bag for disposal.
4. If the blood is tainted, the MLT will review the results and check whether he/she needs to archive the sample. If the sample needs to be archived, he/she will prepare the aliquot sample, label storage barcode, store the samples and process the bags for disposal in the autoclave bag.
5. If there is no necessity for sample to be archived, the blood bags will be stored straight in to the autoclave bag.
6. The bags will be autoclaved and then disposed to a biohazard bag.
7. All transactions will be documented, report printed out and the bags will be disposed as per MOH policy.

4.7. HIGH LEVEL WORKFLOW FOR PROCESSING TEST REQUEST IN BLOOD BANK BBIS/WF/7

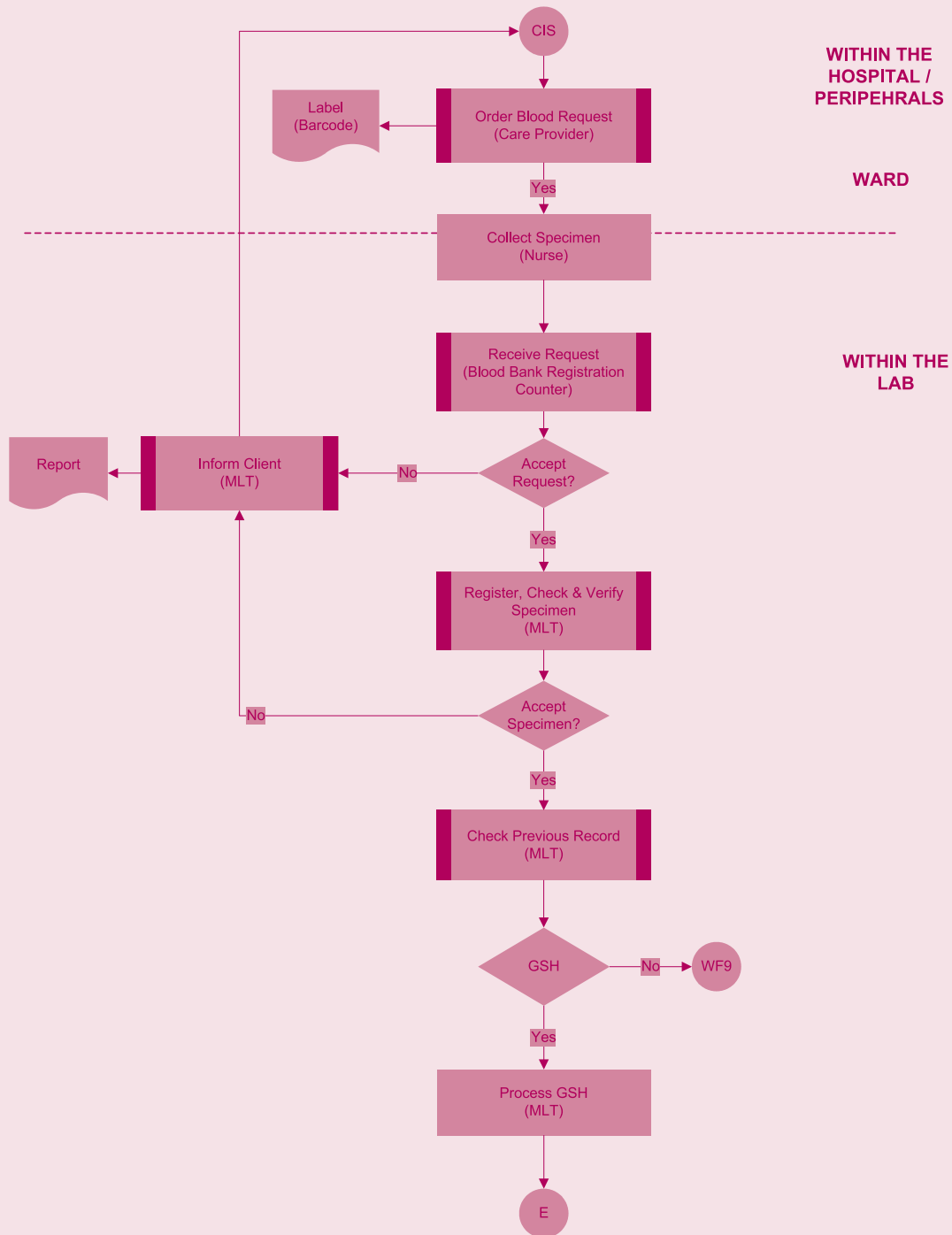


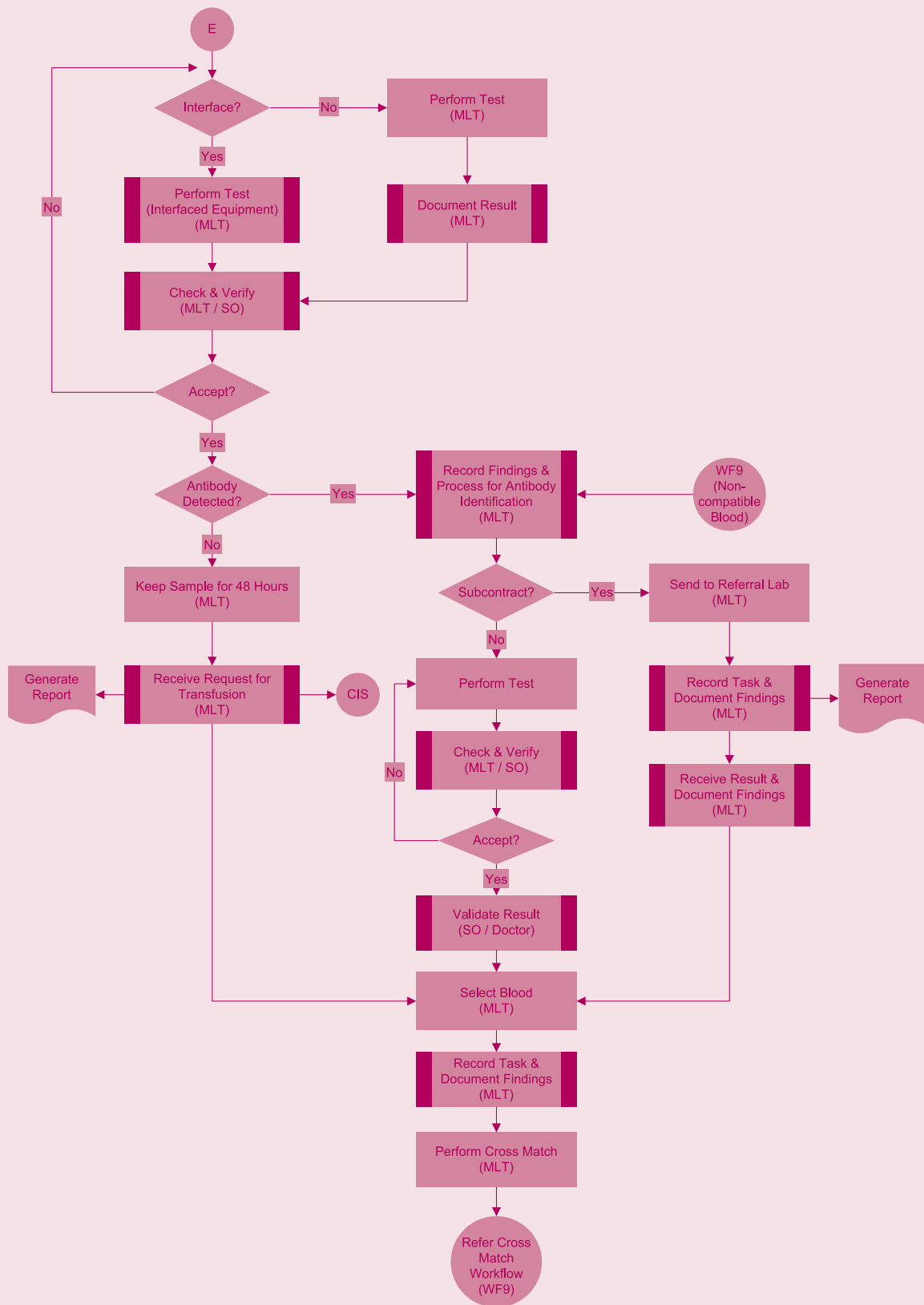


HIGH LEVEL WORK PROCEDURE FOR PROCESSING TEST REQUEST IN A BLOOD BANK BBIS/WP/7

1. This high-level work procedure is applicable for test requests to be processed in the blood bank of the hospital. It is applicable for requests from within the hospital or from within the enterprise.
2. The doctor will log in the request through the CIS. The nurse will print the barcode label and check whether the patient needs an appointment to perform the test. If an appointment is required, it will be scheduled and collection of the specimen will be done on the appointed date.
3. The MLT will receive the specimen in the blood bank and register the specimen.
4. He/she will check the specimen to see whether it can be accepted. If not acceptable, the specimen will be rejected and the doctor/nurse will be informed through phone and online.
5. If accepted, the MLT will check to see whether any reprint of labels are required. If additional labels are required, it will be printed, and the specimen will be sorted and distributed.
6. The MLT in the workstation will check and verify the specimen to conform the acceptance of the specimen for testing. If not acceptable, the specimen will be rejected, the reasons recorded and the doctor/nurse will be informed through the phone and on line.
7. The MLT will then proceed to check whether additional tests are required. If required, labels will be reprinted.
8. The tests will be performed manually and the results recorded in the system or in the interfaced equipment where the results will be automatically generated. This depends on the availability of the equipment.
9. The results will be checked and verified by the MLT/SO. If accepted, it will be sent for validation by the SO/doctor. If the results are not accepted, it will be repeated.
10. The doctor will record the interpretation if required and results will be released to the CIS.

4.8. HIGH LEVEL WORKFLOW FOR PROCESSING GROUP, SCREEN AND HOLD (GSH) AND CROSS MATCH (XM) TEST REQUEST
BBIS/WF/8





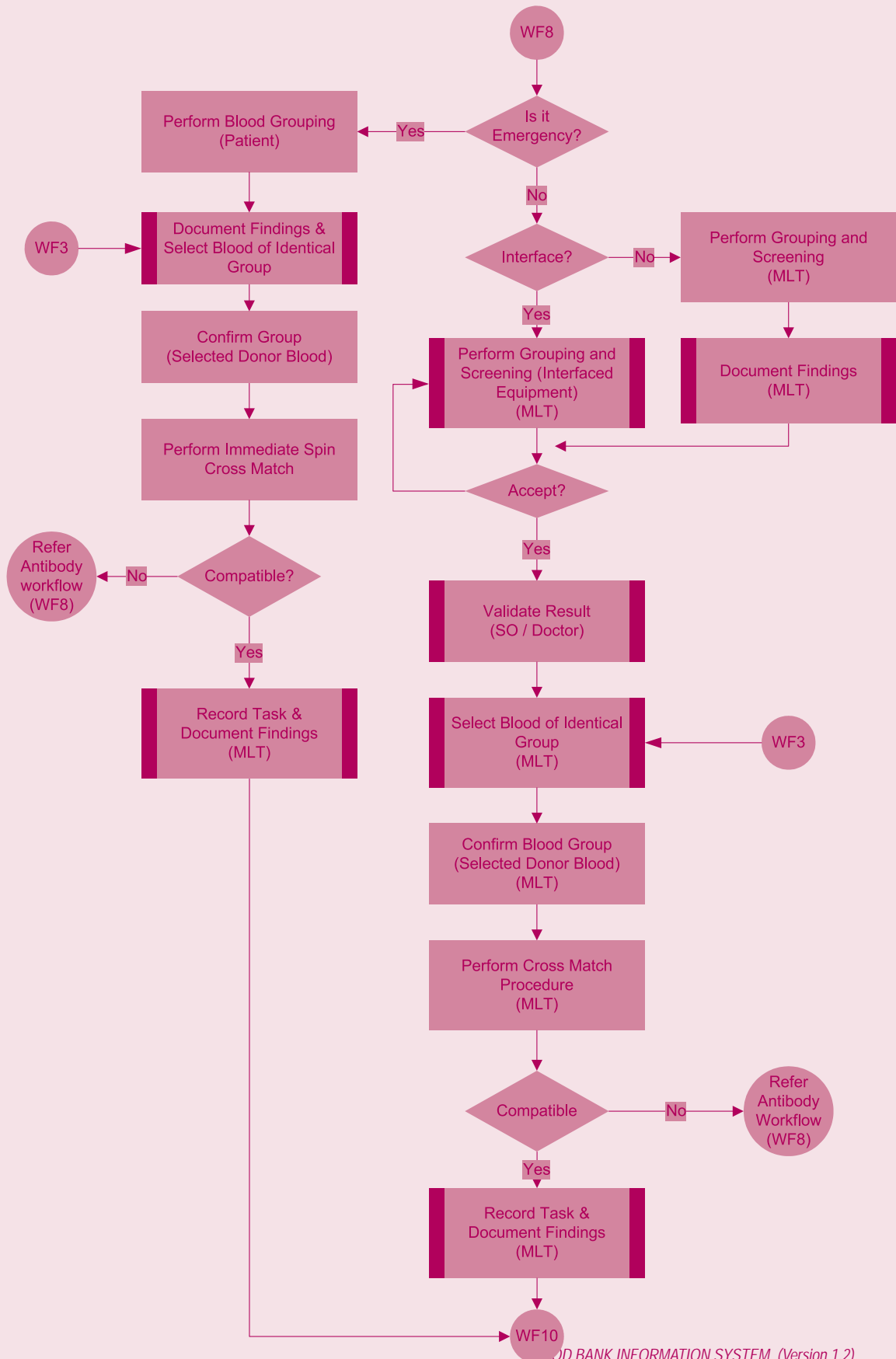
HIGH LEVEL WORK PROCEDURE FOR PROCESSING GROUP, SCREEN AND HOLD (GSH) AND CROSS MATCH TEST REQUEST

BBIS/WP/8

1. This high-level work procedure is applicable for processing test request for GSH and cross match. It is applicable for requests from within the hospital or from within the enterprise.
2. The doctor will order the test request. Upon raising the order, the nurse will print the bar code label.
3. The nurse will collect the specimen and send it to the blood bank as per the hospital operational policy.
4. The MLT in the blood bank lab will receive the specimen and check whether it can be accepted.
5. If the specimen is not accepted, he/she will reject the specimen, record the reasons for rejection and inform the nurse through phone and online.
6. If the specimen is acceptable, he/she will register, check and verify the specimen.
7. If not acceptable, he/she will reject the specimen, record the reasons for rejection and inform the nurse through phone or online.
8. If acceptable, the MLT will check for previous record to see for requests for GSH. If a previous request for GSH is found, the specimen will continue to be processed.
9. If there is no previous request for GSH, the specimen will be processed for cross match as per work procedure BBIS/WP/9.
10. The test will be performed manually or with interfaced equipment, depending on the availability of the equipment.
11. The result will be checked and verified; if not acceptable it will be repeated.
12. If accepted, the MLT will check to see whether any antibody is detected.
13. If antibody is not detected, the sample will be kept for 48 hours.
14. If the antibody is detected, the MLT will process for antibody detection tests.
15. He/she will check whether the test can be performed in the hospital lab or needs to be sent to a subcontracted lab.

16. If the test has to be sent to a referral lab, the MLT will send the specimen and record the task and produce the report. Upon receiving the result from the sub-contracted lab, the MLT will enter the result and the blood will be selected.
17. If the test is to be performed in the hospital lab, the MLT will proceed to perform the test, which will be checked and verified by a SO or senior MLT. Upon verification, the result will be validated by the doctor or the SO.
18. The request for blood transfusion will be received through the CIS for facilities connected on line or through phone or manual forms for facilities, which are off line.
19. Upon receiving the request for transfusion, the MLT will select the blood whose results have been validated by the doctor and will record it in the system.
20. The MLT will perform the cross match test. Refer BBIS/WP/9.

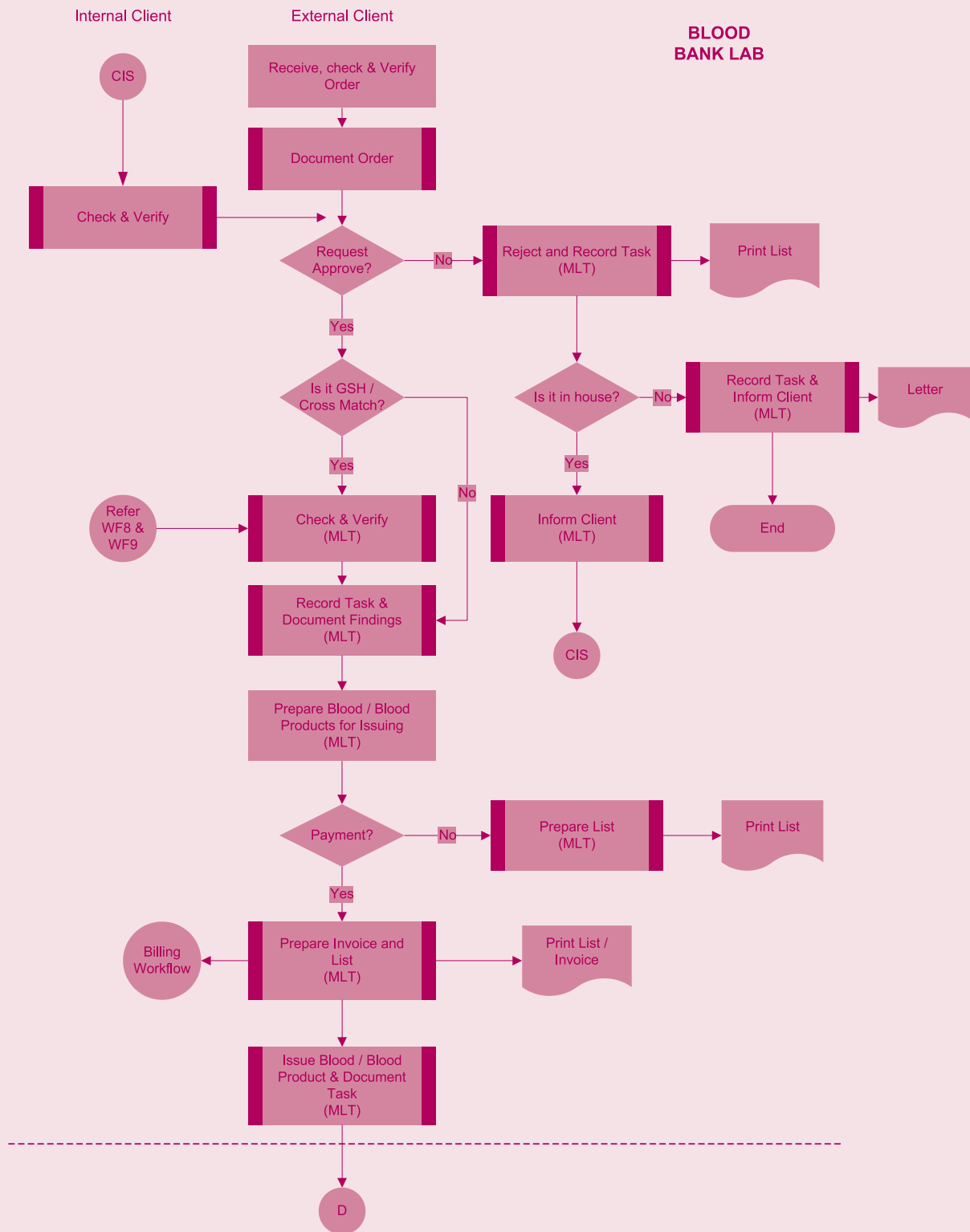
4.9. HIGH LEVEL WORKFLOW FOR PERFORMING CROSS-MATCH TEST BBIS/WF/9



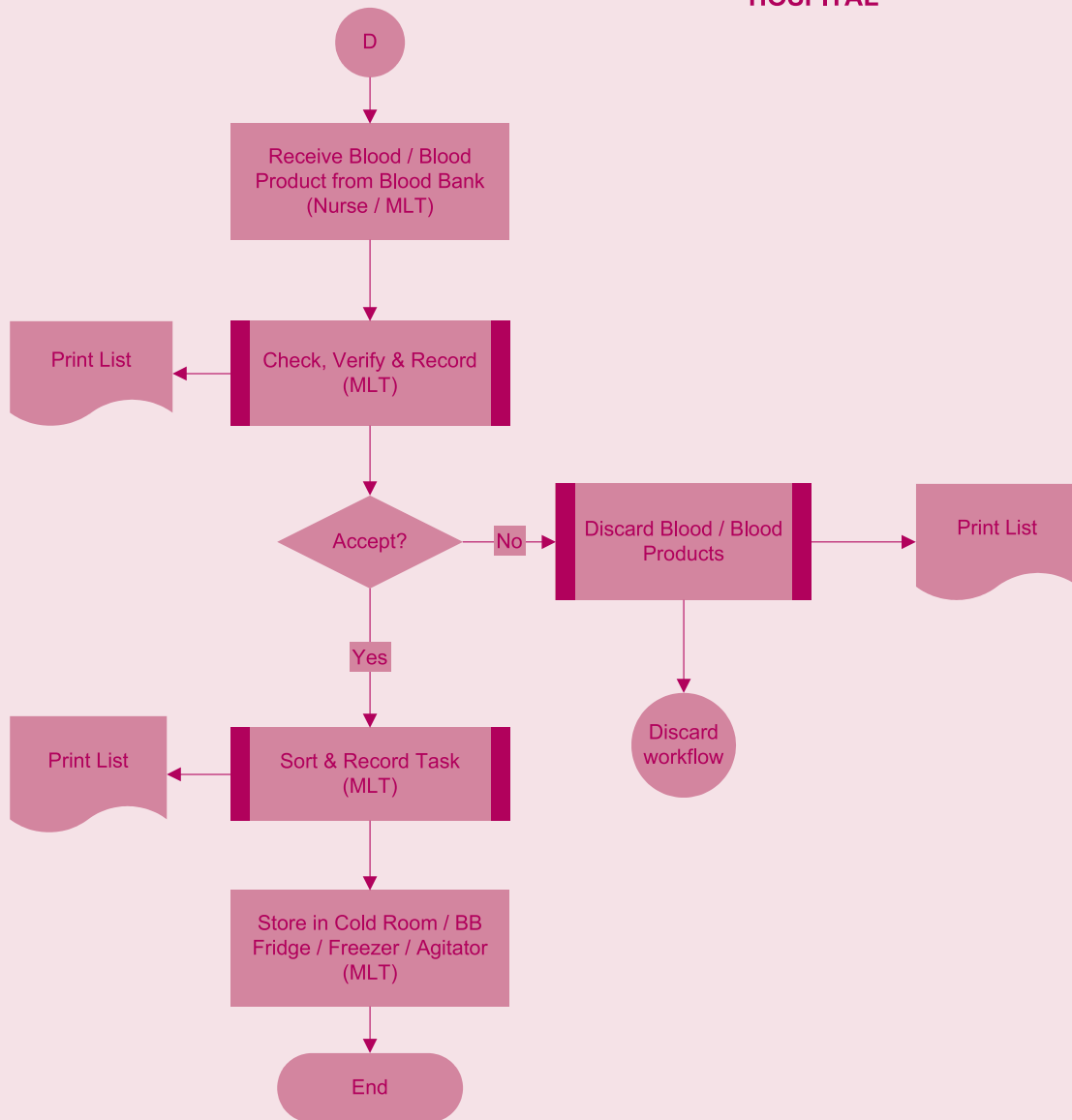
HIGH LEVEL WORK PROCEDURE FOR PERFORMING CROSSMATCH BBIS/WP/9

1. This high-level work procedure is applicable for processing request for blood cross matches in the hospital blood bank. It is applicable for both emergency and non emergency requests.
2. The request is made by the doctor in the CIS. Refer BBIS/WP/8.
3. The MLT will check whether the request is for emergency transfusion or for group, cross match, hold. If the request is for emergency transfusion, the MLT will proceed to test the blood group of the patient.
4. Upon conforming the patient's blood group, the MLT will select the blood of the identical group. Refer BBIS/WP/9.
5. Upon confirming the selected donor's blood group, the MLT will perform immediate spin and cross match.
6. If the patient's and the donor's blood is found to be incompatible, the MLT will process the antibody testing. Refer BBIS/WP/8.
7. If found compatible, the MLT will document the result and proceed with the supply. Refer BBIS/WP/10.
8. If the request for cross match is not for emergency transfusion, the MLT will perform the grouping and screening test, either with equipments with interface or without interface depending on the availability of the equipment.
9. Upon completion, the results will be documented and verified by the MLT before accepting it.
10. Upon acceptance, the results will be validated by the SO/Doctor.
11. Once the result is validated, the MLT will select the identical blood group from a donor. Refer BBIS/WP/3.
12. Upon confirming the blood group of the selected donor, the MLT will perform cross match procedure.
13. If antibody is detected, he/she will proceed with antibody identification. Refer BBIS/WP/8.
14. If there are no antibodies detected, the MLT will document the findings and proceed to supply the blood. Refer BBIS/WP/10.

4.10. WORKFLOW FOR PROCESSING REQUEST FOR BLOOD / BLOOD PRODUCT SUPPLY BBIS/WF/10



**WARD /
HOSPITAL**



HIGH LEVEL WORK PROCEDURE FOR PROCESSING REQUEST FOR BLOOD/BLOOD PRODUCTS BBIS/WP/10

1. This high-level work procedure is applicable for processing requests for the supply of blood/blood products both from within and outside the hospital. This is applicable for both online electronic and non-electronic requests and for inventory management.
2. All requests from internal clients will come from the CIS and those from the external clients will be received manually where the order entry will be made into the system by the MLT.
3. Upon receiving the request, the MLT will check and verify the order details.
4. If the request is not approved, the MLT will inform the client through the CIS for internal patients and through a letter for external patients. However for all requests which are rejected, the care providers will be informed through phone.
5. If the request is approved, the MLT will check for details and prepare blood and blood products for issuing.
6. If payment is required, invoice will be prepared with the list. If no payment is required, the list will be prepared and blood/blood products will be issued against the list.
7. The MLT from the requesting hospital will verify the product against the list.
8. If accepted, he/she will check whether grouping is required.
9. If grouping is required, the task will be performed and verified whether the grouping is correct.
10. If grouping is not correct, the supply will be sent back to the supplier and report generated.
11. If correct, he/she will sort according to blood group and store in the hospital Blood Bank.
12. If the supply is not accepted, the blood / blood product will be discarded (Refer discarded workflow).

5.1. Donor / Recipient Management:-

- 5.1.1. Ability of the system to trace all recipients of a particular donor.
- 5.1.2. Ability of the system to trace all donors to a particular recipient.
- 5.1.3. Ability to provide Audit trail from vein of the donor to the vein of the recipient and database history for medico legal and look back system.
- 5.1.4. Ability to append /edit results by authorized personnel.
- 5.1.5. For online request, system ability to capture the data in an approved format.
- 5.1.6. The mandatory data for a request are:-

- 5.1.6.1. Name.
- 5.1.6.2. IC / Passport / Others.
- 5.1.6.3. RN.
- 5.1.6.4. Request type.
- 5.1.6.5. Name of requesting doctor.

- 5.1.7. Mandatory data for request for blood / blood components (in addition to 5.4) are:-

- 5.1.7.1. Type of components.
- 5.1.7.2. No. of units required.
- 5.1.7.3. Date and time components required.

- 5.1.8. Ability to provide reagent log details such as lot number, batch number, expiry date and manufacturer.
- 5.1.9. Ability to capture and store the following information for Blood grouping:-

- 5.1.9.1. Sample No.
- 5.1.9.2. Test results.
- 5.1.9.3. Date & Time tests performed.
- 5.1.9.4. Identity of person (s) entering / validating results.
- 5.1.9.5. Technique used for performance of tests.

- 5.1.10. Ability of the system to alert if there are discrepancies between current blood grouping results of the individual with that available in the system.
- 5.1.11. System shall be able to alert the compatibility of donor and recipient blood based on rule based criteria.

5.2. Antibody screening and identification:-

- 5.2.1. The methodology used should be stored with the result.
- 5.2.2. The system should support entry of more than one antibody specificity and the date of identification for each separate antibody should be stored.
- 5.2.3. There should be a facility to allow for comments, e.g:-

- 5.2.3.1. Of no clinical significance.
- 5.2.3.2. Of clinical significance.
- 5.2.3.3. Phenotype of patients' red cells, etc.

5.3. Direct antiglobulin test (DAT):-

- 5.3.1. When entering results on DAT, the system should be able to record the type of sample tested.

5.4. Investigations of transfusion reactions.

5.5. Pregnancy-related testing:-

- 5.5.1. It should be possible to associate the following with the patient record, including:-

- 5.5.1.1. Number of gestation weeks at the time of testing.
- 5.5.1.2. Fetomaternal haemorrhage details in ml.
- 5.5.1.3. Dose and batch, number of anti-D immunoglobulin issued (allow for multiple entries).
- 5.5.1.4. The issuance of compatible Rh positive blood to a Rh negative patient should demand authorization by the doctor in charge of the Blood Bank.

- 5.5.2. A recall system linked to gestation would be useful. If there is a system in operation to recall antenatal patients, this should be in accordance with standards approved by MOH.

- 5.5.3. There should be facilities to record the results of antibody titration and / or antibody quantification.

- 5.5.4. There should be facilities to request and enter results of the partner's phenotype. It should be possible to link the patient and partner records.

- 5.5.5. It should be possible to enter coded and text free comments against patients' results.

5.6. Compatibility testing:-

- 5.6.1. The system must not allow selection of ABO-incompatible red cell units. The issuance of suitable, but non-identical, ABO group red cells should demand authorization from the lab personnel.

- 5.6.2. For components other than red cells, it should be possible to define criteria locally, with regards to ABO and RhD acceptability.

- 5.6.3. The system should allow a definable reservation period for crossmatched units.

- 5.6.4. The system should allow the following to be entered against each unit crossmatched:-

- 5.6.4.1. Date and time test performed.
- 5.6.4.2. Identity of person (s) entering / validating results.

- 5.6.5. After verification of results, compatibility reports and labels must be produced.
 - 5.6.6. The crossmatched record should retain information on both compatible and incompatible units.
 - 5.6.7. The system should allow the issuance under authorization control of ABO-compatible, but serologically incompatible units in exceptional circumstances. All such units must be appropriately labelled.
- 5.7. Red cell units released for emergency issue:-
- 5.7.1. The system should allow for the issue of 'emergency' units, either O RhD negative or O RhD positive, without a known patient blood group.
 - 5.7.2. It should be possible to issue group-compatible units, based on an emergency blood group only, prior to entry of antibody screen or compatibility results.
 - 5.7.3. Retrospective entry of further tests, e.g. compatibility results, should be allowed with recording of timing of such entries.
- 5.8. Blood and Blood component handling:-
- 5.8.1. Barcodes and text display of barcoded information will comply with the standards approved by PDN for uniform labelling of blood and blood components.
 - 5.8.2. Where check characters are included, systems must use these to validate the data inputs.
 - 5.8.3. Entry of stock onto the system for all blood and blood components should be by means of electronic transfer or barcode reader. The following information must be captured for each individual unit:-
 - 5.8.3.1. Unique donation number.
 - 5.8.3.2. ABO and RhD group.
 - 5.8.3.3. Component code.
 - 5.8.3.4. Expiry date.
 - 5.8.4. For comments against the component, e.g:-
 - 5.8.4.1. Additional typing.
 - 5.8.4.2. CMV negative.
 - 5.8.4.3. Irradiated.
 - 5.8.4.4. Transfer form.
 - 5.8.5. The system must be able to store and recall the crossmatch history of all units received in the blood bank.
 - 5.8.6. Mandatory information:-
 - 5.8.6.1. Unique donation number.
 - 5.8.6.2. Nature of unit and special characteristics.
 - 5.8.6.3. Date and time of receipt.

- 5.8.6.4. Date of expiry and time where appropriate.
- 5.8.6.5. Dates and time of issue.
- 5.8.6.6. Patient (s) to whom unit was previously allocated.
- 5.8.6.7. Details of patient to whom unit was transfused.
- 5.8.6.8. The date of transfusion.
- 5.8.6.9. Reason for discard if not transfused, e.g. received damaged, out dated, inappropriate storage, others.

5.8.7. All manipulations of blood and blood components before issuance must be recorded.

5.9. Stock movements:-

- 5.9.1. The system should be able to record and store details of unit movements including transfer between unreserved and reserved stock, transfer to and from satellite refrigerators, issues to ward and departments and transfer to other hospitals.
- 5.9.2. Where units are removed for patient use, an issuance program should be available. This is to provide an audit trail for units leaving the blood bank. It is desirable that such an issue program should have electronic access to the main blood transfusion system to provide the facility for improved issue controls. Such a program should require entry of the following:-

- 5.9.2.1. Identity of the individual collecting the units.
- 5.9.2.2. Hospital number of other appropriate patient identifier.
- 5.9.2.3. Destination of unit.
- 5.9.2.4. The barcodes of the units.

- 5.9.3. With each issue, the system must record the date and time.
- 5.9.4. The system should allow the return of unused blood / blood products within the defined period (as defined by local policy) to the stock inventory.
- 5.9.5. The system should invalidate the barcode of unused units upon its return to the inventory.
- 5.9.6. Units returned unused, should be booked in using a similar procedure and the time out of the blood bank should be logged against that unit. If the time out of storage exceeds that defined by local policy, a warning should be generated and action taken in line with standard procedures.
- 5.9.7. The system should allow for a comment on adverse reactions following transfusion of a component.

5.10. Batch products:-

- 5.10.1. The system should allow entry of multiple quantities of fractionated products from single batch products of large pooled plasma.
- 5.10.2. The system should not require any additional labelling of individuals units.
- 5.10.3. Issuance of single or multiple units to individual patients should be possible and details recorded and stored must include:-

- 5.10.3.1. Patient identity.
- 5.10.3.2. Date of administration.
- 5.10.3.3. Batch number.
- 5.10.3.4. No. of units.

5.11. Request to the Blood Centre:-

- 5.11.1. The system should be able to generate a request for stock that can be transmitted to the Blood Centre by electronic data transfer.
- 5.11.2. The system should be able to receive request for blood, blood components from approved health facility through EDT.
- 5.11.3. The system should adhere to a standard data set as approved by MOH.
- 5.11.4. The request should have a unique number / date code that should include time and identity of person making the order.

5.12. Receipt of issuance details and test results from the Blood Centre:-

- 5.12.1. The system should be able to accept from the Blood Centre, electronic transfer of issuance details and test results.
- 5.12.2. Peripheral enquiry.
- 5.12.3. It is desirable that users in theatres or wards can enquire via distant terminals on the availability of reserved stock for patients.
- 5.12.4. Other information, e.g. if patient has typical antibodies, previous transfusion reactions may be useful.

5.13. Management information:-

- 5.13.1. The system should have inbuilt query system to generate routine and adhere reports as identified under the operational policy.
- 5.13.2. There is a demand for ad hoc management information and the system should be able to support enquiry either by inbuilt query support or by making the database available for external access. It is important that such ad hoc enquiry has access to all data items.
- 5.13.3. Stock information:-
 - 5.13.3.1. The system should be able to access at any time details of both reserved and unreserved stock held by type of units, group and special characteristics.
 - 5.13.3.2. This should include details of shelf life of all units (i.e. time to expiry) and be able to give a list of units in order of remaining shelf life for any unit type and ABO and RhD group.
 - 5.13.3.3. The system should be able to give details of stock received, stock used, and stock discarded at monthly or other intervals as required by HC 84(7).

5.14. Donor Registry:-

- 5.14.1. Ability for the system to link all blood donation centres to generate the National Blood Donor Registry.
- 5.14.2. Ability for the system to maintain the National Donor Registry.
- 5.14.3. Ability for the system to provide access from all donation centres.
- 5.14.4. Ability for the system to provide access for authorized personnel to amend or append registry details. Saved data shall not be deleted.

5.15. Donor Incentives:-

- 5.15.1. Ability for the system to alert eligibility status of the donor.
- 5.15.2. Ability for the system to provide decision support to determine the incentives for the donor in accordance to predetermined criteria.

5.16. Management reports:-

- 5.16.1. Ability of the system to provide reports as per requirements in the functional specifications.

- 6.1. The proposed workflow will apply for an integrated enterprise wide network.
- 6.2. Adequate hardware and software provision to support the workflow.
- 6.3. The lab does not provide for tissue and organ bank.
- 6.4. Linkages will be provided with the Blood Bank Information System in PDN.
- 6.5. On line donor recruitment will be allowed.
- 6.6. Promotion for donor recruitment will be online and will form part of Health – On – Line portal.
- 6.7. All equipments will have interphase facilities.
- 6.8. Hospital Information System will be linked to the Blood Bank Information System in the National Blood Centre.

- 7.1. Cord Blood.
- 7.2. Peripheral Stem Cell.
- 7.3. Bone Marrow Stem Cell.
- 7.4. Enterprise refer to health care facilities operating within a network integrated through service and functional needs connected through the information systems.
- 7.5. PDN – Pusat Darah Negara.

WORK PROCESS	SYSTEM FUNCTION	DATA OUTPUT	DATA INPUT
Management report Ministry of Health:- 1. Donor management.	<ul style="list-style-type: none"> Query tools "from to". Query by standard selection criteria to be defined by core team). Listing and statistical report requirement (core team to decide on the list). 	PER-SS-BT201 (Report on Blood Transfusion Services):- 1. Blood collection:- <ul style="list-style-type: none"> Name of the hospital. No. of donors. <ul style="list-style-type: none"> Voluntary donor:- <ul style="list-style-type: none"> New. Regular. Replacement donor. Total. Type of donors:- <ul style="list-style-type: none"> Police. Army. Student. Others. No. of group donation:- <ul style="list-style-type: none"> Blood Bank. Mobile. No. of units of blood collected or received:- <ul style="list-style-type: none"> Blood Bank. Mobile. Other hospital. Total collected. 	<ul style="list-style-type: none"> Donor personal particulars:- <ul style="list-style-type: none"> Name. My Kad / IC / Passport. PMI. DOB. Sex. Ethnic group. Occupation. Address. Tel. No. (home /office / mobile). Email. Location:- <ul style="list-style-type: none"> Encounter type registration blood bank. Blood unit collected / received / utilized:- <ul style="list-style-type: none"> Blood Bank Information System.

WORK PROCESS	SYSTEM FUNCTION	DATA OUTPUT	DATA INPUT
	<ul style="list-style-type: none"> • Query tools “from to”. • Query by standard selection criteria (to be defined by core team). • Query from drop down list during donor registration. • Listing and statistical report requirement (core team to decide on the list). 	<p>2. Blood utilization:-</p> <ul style="list-style-type: none"> • No. of blood recipients. • No. of units of blood utilized:- <ul style="list-style-type: none"> • Transfused. • Not suitable. • Expired. • Sent to other hospital. • Total. <p>PER-SS-BT202 (Report on No. of Blood Donors and Recipient by State, Region and Ethnic Breakdown):-</p> <p>1. Ethnic group:-</p> <ul style="list-style-type: none"> • Malay. • Chinese. • Indian. • Bajau. • Dusun. • Kadazan. • Murut. • Other Bumiputera Sabah. • Sarawak Malay. • Melanau. • Kedayan. • Iban. • Bidayuh. • Other Bumiputera Sarawak. 	<ul style="list-style-type: none"> • Donor personal particulars:- <ul style="list-style-type: none"> • Name. • My Kad / IC / Passport. • PMI. • DOB. • Sex. • Ethnic group. • Occupation. • Address. • Tel. No. (home / office / mobile). • Email. • New / regular donor:- <ul style="list-style-type: none"> • Encounter type registration blood bank. • Blood recipient:- <ul style="list-style-type: none"> • PMS / CIS.

WORK PROCESS	SYSTEM FUNCTION	DATA OUTPUT	DATA INPUT
		<ul style="list-style-type: none"> • Orang Asli Semenanjung. • Non citizen. • Others. 2. Sex:- <ul style="list-style-type: none"> • Male. • Female. 3. No. of volunteer blood donors:- <ul style="list-style-type: none"> • New. • Regular. 4. No. of replacement blood donors. 5. Total no. of blood donors. 6. No. of blood recipients.	
	<ul style="list-style-type: none"> • Query tools "from to". • Query by standard selection criteria (to be defined by core team). • Query from drop down list during donor registration. • Listing and statistical report requirement (core team to decide on the list). 	PER-SS-BT203A (Report on Blood Test and Blood Component Prepared and Utilized):- <ol style="list-style-type: none"> 1. Type of blood test:- <ul style="list-style-type: none"> • Blood grouping. • Cross matching. • Rhesus typing:- <ul style="list-style-type: none"> • Anti-D Negative. • Rh Phenotyping. • Rh Negative. • Antibody screening (Coomb's Test):- <ul style="list-style-type: none"> • Direct AHG. • Indirect AHG. 	<ul style="list-style-type: none"> • Type of blood test:- <ul style="list-style-type: none"> • LIS. • Blood donor:- <ul style="list-style-type: none"> • PER-SS-BT201. • Blood recipient:- <ul style="list-style-type: none"> • CIS. • Antenatal:- <ul style="list-style-type: none"> • Encounter type registration /Location. • Blood component:- <ul style="list-style-type: none"> • Blood Bank Information System.

WORK PROCESS	SYSTEM FUNCTION	DATA OUTPUT	DATA INPUT
		<ul style="list-style-type: none"> • Rhesus Antibodies. • Lewis Antibodies. • Others Antibodies. • Investigation of Transfusion Reactions. • Haemolysin (saline) Titre. • VDRL / RPR. • TPHA / TPPA. • HIV Screening. • Hepatitis B Virus Screening. • HCV (Hepatitis C) Screening. • Haemoglobin. • Other Tests. <ol style="list-style-type: none"> 2. Blood donor. 3. Blood recipient. 4. Antenatal. 5. Others. 6. Total. 	
		<ol style="list-style-type: none"> 1. PER-SS-BT-203B Report on Blood Component and components prepared, utilised and destroyed. 2. Blood Component:- <ul style="list-style-type: none"> • Whole Blood. • Packed Red Blood Cells. • Leucocyte Poor RBC. • Filtered Red Blood Cells. 	

WORK PROCESS	SYSTEM FUNCTION	DATA OUTPUT	DATA INPUT
		<ul style="list-style-type: none"> • Washed RBC. • Random Platelet Concentrate. • Apheresis Plasma. • Apheresis / Single donor platelet. • Fresh Frozen Plasma. • Cryoprecipitate. • Cryosupernatant. • Ordinary Plasma (Recovered Plasma). • Paediatric bag. • Irradiated Platelet. • Irradiated Red Blood Cells. • Glycerolized Frozen Red Blood Cell. • Deglycerolized Frozen Red Blood Cell. • Viral Inactivated Platelet. • Viral Inactivated Plasma. • Viral Inactivated cryoprecipitate. • Apheresis Red Cell. • Cord Blood. • Others. • Total Blood Components. <ol style="list-style-type: none"> 3. Number Prepared. 4. Number supplied. 5. Number Utilized. 6. Number destroyed. 	

WORK PROCESS	SYSTEM FUNCTION	DATA OUTPUT	DATA INPUT
	<ul style="list-style-type: none"> Query tools "from to". Query by standard selection criteria (to be defined by core team). Query from drop down list during donor registration. Listing and statistical report requirements (core team to decide on the list). 	<p>PER-SS-BT204 (Report on blood sample reactive and confirmed positive for screening test on blood transfusion services):-</p> <ol style="list-style-type: none"> Hospital. State. Month. Year. Total donation. Test:- <ul style="list-style-type: none"> Human Immuno Deficiency Virus (Anti HIV 1/2). Hepatitis B Virus (HBsAg). Hepatitis C Virus (Anti HCV). Syphilis (VDRL / RPR). Result:- <ul style="list-style-type: none"> Repeat reactive. Confirmed positive. 	<ul style="list-style-type: none"> Type of blood test:- <ul style="list-style-type: none"> LIS. Blood donor:- <ul style="list-style-type: none"> PER-SS-BT201. Encounter type registration / Location.
	<ul style="list-style-type: none"> Query tools "from to". Query by standard selection criteria (to be defined by core team). Query from drop down list during donor registration. Listing and statistical report requirements (core team to 	<p>PER-SS-BT206 (Report of Laboratory Investigations for Patients / Inpatients Done):-</p> <ol style="list-style-type: none"> State. Location:- <ul style="list-style-type: none"> National Blood Center (Pusat Darah Negara). Inpatient. 	<ul style="list-style-type: none"> Location. Encounter type registration blood bank. Type of test / level of laboratory. LIS.

WORK PROCESS	SYSTEM FUNCTION	DATA OUTPUT	DATA INPUT
	decide on the list).	<ul style="list-style-type: none"> • Outpatient. • State total. 3. Tests:- <ul style="list-style-type: none"> • Clinical Tests. • Haematology. • Biochemistry. • Microbiology. • Immunology / serology. • Histopathology. • Other Test. 4. Total. 5. Level of Laboratory.	
	<ul style="list-style-type: none"> • Query tools "from to". • Query by standard selection criteria (to be defined by core team). • Query from drop down list during donor registration. • Listing and statistical report requirements (core team to decide on the list). • Add drug addict information in the order entry templates. 	KKK 209 Pindaan 6/1992 (Monthly / Yearly Report for Medical Personnel, Blood Donors and Drug Addicts Tested for Hepatitis B and Vaccination Programme for Medical Personnel, Blood Donors and New Born Babies):- <ol style="list-style-type: none"> 1. State. 2. Hospital. 3. Year. 4. Month. 5. Medical personnel tested for Hepatitis B. <ul style="list-style-type: none"> • Government hospital:- <ul style="list-style-type: none"> • No. of tests. 	<ul style="list-style-type: none"> • State / district / unit:- • NHDD. • Type of test / personnel:- • PER-SS-BT201 / 202. • Vaccination information:- • CIS.

WORK PROCESS	SYSTEM FUNCTION	DATA OUTPUT	DATA INPUT
		<ul style="list-style-type: none"> • Result:- <ul style="list-style-type: none"> • Negative. • Positive. <p>6. Medical personnel given Hepatitis B vaccination:-</p> <ul style="list-style-type: none"> • Government hospital:- <ul style="list-style-type: none"> • Dose 1. • Dose 2. • Dose 3. <p>7. Blood donors:-</p> <ul style="list-style-type: none"> • Tested for Hepatitis B:- <ul style="list-style-type: none"> • No. of tests. • Result:- <ul style="list-style-type: none"> • Negative. • Positive. • Given Hepatitis B vaccination:- <ul style="list-style-type: none"> • Dose 1. • Dose 2. • Dose 3. 	
QA Report.	<ul style="list-style-type: none"> • Query tools "from to". • Query by standard selection criteria (to be defined by core team). • Query from drop down list during donor registration. • Listing and statistical report 	<p>Adverse Transfusion Events:-</p> <p>1. Product implicated:-</p> <ul style="list-style-type: none"> • Whole blood. • Platelets. • Packed red cells. • Cryoprecipitate. • Plasma (FFP). 	<ul style="list-style-type: none"> • Adverse Transfusion Event:- <ul style="list-style-type: none"> • LIS. • CIS.

WORK PROCESS	SYSTEM FUNCTION	DATA OUTPUT	DATA INPUT
	<p>requirements (core team to decide on the list).</p>	<ul style="list-style-type: none"> • Others (specify). 2. Date of transfusion. 3. Time. 4. Adverse events:- <ul style="list-style-type: none"> • Incorrect blood or component transfused. • Acute transfusion reaction (occurring within 24 hours):- <ul style="list-style-type: none"> • Mild (rash & itchiness). • Moderate (fever, chills & rigors +/- above). • Severe (with dyspnoea, low BP, chest pain, bronchospasm) including anaphylaxis. • Delayed transfusion reactions (occurring >24 hours following transfusion). • Bacterial contamination. • Post transfusion viral infection. • Post transfusion purpura. • Transfusion associated graft versus Host Disease (TA-GVHD). • Transfusion related acute lung injury (TRALI). • Others (describe reaction) e.g. Pulmonary oedema. 	

WORK PROCESS	SYSTEM FUNCTION	DATA OUTPUT	DATA INPUT
		5. Certainty of reaction:- <ul style="list-style-type: none"> • Suspected and not confirmed. • Certain. 6. Patient outcome:- <ul style="list-style-type: none"> • No adverse outcome. • Morbidity due to event. • Death due to event. 7. Patient's particulars:- <ul style="list-style-type: none"> • Name. • IC No. • Ward. • Age. • Race. • Sex. 8. Reported by:- <ul style="list-style-type: none"> • Name. • Designation. • Date of reporting. • Tel. No. 	

1. Dato' Dr. Yasmin Ayob (Advisor).
2. Dr. Faraizah Karim (Pusat Darah Negara).
3. Dr. Hamidah Abu Bakar (Hospital Seremban).
4. Dr. Nor Azian Abdul Samad (Hospital Melaka).
5. Dr. Joshua Daniel (Hospital Melaka).
6. Pn. Kalaiselvi (Hospital Selayang).
7. Pn. Rosaline Choo Pok Yoke (Pusat Darah Negara).
8. En. Ariffin Mohd Yusof (Pusat Darah Negara).
9. En. Abdul Hamid Bon (Pusat Darah Negara).

Secretariat:-

1. Datin Dr. S. Selvaraju.
2. Dr. Dang Siew Ing (October 2000 - September 2001).
3. Dr. Lailatul Akmar Mat Nor (November 2001 - November 2003).
4. Dr. Fazilah Shaik Allaudin (2004 Onwards).
5. Tn. Hj. Umar Mohd Baki (Until September 2001).
6. Sarniah Sidek (from October 2005).
7. Sanisah Laily (from July 2006).

Reference:-

1. Guidelines for Blood Bank Computing Revised 30th March 2000 accepted for Publication 21st August 2000.
2. National Consensus Meeting, MOH 13th - 15th May 2002.
3. National Consensus meeting HUKM 8th August 2006.

Members:-

- | | | |
|----|---------------------------|---|
| 1. | Dr. Rosnah Hadis | - Director, Planning and Development Division, MOH. |
| 2. | Mr.Lai Lim Swee | - Deputy of Director, Pharmacy Division, MOH. |
| 3. | Dr. Mohd Arif Mohd Hashim | - Pathologist, Hospital Kuala Lumpur. |
| 4. | Dr. Zaharah Musa | - Radiologist, Hospital Selayang. |

Speakers:-

- | | | |
|----|--------------------------------------|---|
| 1. | Tan Sri Dato' Dr. Abu Bakar Suleiman | - Chairman, TC Health Informatics, SIRIM. |
| 2. | Datin Dr. S. Selvaraju | - Information Documentation System Unit, MOH. |
| 3. | Dr Fazilah Shaik Allaudin | - Planning and Development Division, MOH. |
| 4. | Dr. Zanariah Alias | - Pathologist, Hospital Ampang. |
| 5. | Dr. Faraizah Abdul Karim | - Deputy Director, National Blood Bank. |
| 6. | Pn. Kamarunnesa Mokhtar Ahmad | - Pharmacist, Hospital Serdang. |
| 7. | Mr. Daud Ismail | - Chief Radiographer, Hospital Selayang. |

Participants:-

- | | | |
|-----|--------------------------------|---------------------------------|
| 1. | Pn. Maria Christina Stephenson | SIRIM. |
| 2. | Dato' Dr. Jai Mohan | MHIA. |
| 3. | Dr. Chong Su-Lin | SUNWAY MEDICAL CENTRE. |
| 4. | Ms. Soh Thai Lin | SUNWAY MEDICAL CENTRE. |
| 5. | Mr.Lee Kok Khin | SUNWAY MEDICAL CENTRE. |
| 6. | Ms. Ng Leng Yau | SUNWAY MEDICAL CENTRE. |
| 7. | Rachel Lim | SUNWAY MEDICAL CENTRE. |
| 8. | Eric Yin | SUNWAY MEDICAL CENTRE. |
| 9. | Ching Lai Ling | SUNWAY MEDICAL CENTRE. |
| 10. | Dr. Hj. Lailanor Hj. Ibrahim | Kementerian Kesihatan Malaysia. |
| 11. | Sarniah Sidek | Kementerian Kesihatan Malaysia. |
| 12. | Mohd Mahadzir Tumin | Kementerian Kesihatan Malaysia. |
| 13. | En. Mohd Rodzi Ismail | Lab Link. |
| 14. | En. Mohd Shazwan Lui | Lab Link. |
| 15. | Dr. Wong Kien Seng | KOMPAKAR. |
| 16. | Jacinta Gan Norli | KOMPAKAR. |
| 17. | Norli Mohd Nasir | KOMPAKAR. |
| 18. | Mohd Hanafiah | KOMPAKAR. |
| 19. | Ng Boon Swee | Nova Msc Bhd. |
| 20. | Dylan Suppiah | FSBM M'sian. |

21.	Dr. Badrul Hisham Bahadzor	HUKM.
22.	Dr.Ahmad Taufik Jamil	HUKM.
23.	Aieshah Mohd Zubit	HUKM.
24.	Tengku Norliza Tuan Mohd Ghazali	HUKM.
25.	Norazlina Ahyat	HUKM.
26.	Abdul Rahman Bullah	HUKM.
27.	Pn. Faridah Yusof	HUKM.
28.	En. Dexter Francis Vandof	HUKM.
29.	Prof. Madya Dr. Mokhtar Abu Bakar	HUKM.
30.	Sivagengei Kulaveerasingan	HUKM.
31.	En. Mohd Baharudin	HUKM.
32.	Pn. Halijah Mohd Yunus	HUKM.
33.	En. Rosmadi Baharin	HUKM.
34.	Pn. Norrela Mokhtar	HUKM.
35.	Prof. Madya Dr. Zahiah Mohamed	HUKM.
36.	Dr. Noordin Younus	HUKM.
37.	Dr. Azmi Mohd Tahir	HUKM.
38.	Dr. Raja Zahratul Azma	HUKM.
39.	Abdul Hadi Bin Abdul Rahman	HUKM.
40.	Dr. Saperi	HUKM.
41.	Dr. Amirul Muhd Nur	HUKM.
42.	Halimah Razali	HUKM.
43.	Faridah Abdullah	HUKM.
44.	Rahimah Rahmat	HUKM.
45.	Zainal Abdul Ghani	HUKM.
46.	Dr. Leong Chai Fun	HUKM.
47.	Kol. Dr. Zulkafli Abd. Rahman	MINDEF.
48.	Dr. Mohd Ghazali Mohd Taha	MINDEF.
49.	Selvakumar	Gribbles.
50.	Lim Chong Eng	IJN.
51.	Thong Mee Ling	IJN.
52.	Mizana A. Samad	IJN.
53.	Gunavathy Kalee	KPJ.
54.	Ir. Mahdi Muda	KPJ.
55.	Dr. Anitha K.V	KPJ.
56.	Yusri Ali	KPJ.
57.	Ng Boon Swee	KPJ.

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