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Blood Bank Computer Downtime Procedure

Document Type: Procedure

I. PURPOSE AND OBJECTIVE:

This document will provide Blood Bank staff with supplemental instructions to be used take in the event of a computer downtime for either the Hospital Information System (HIS), Laboratory Information System (LIS) and/or the Blood Bank Computer System (BBIS). These instructions outline the process for each possible downtime scenario including subsequent post-downtime entry of blood bank results into the system.

II. INTRODUCTION:

A. Downtime is the term describing the time when access to normal blood bank computer functions for the laboratory is altered. Two separate computer systems exist, each with it's own hardware and Software: Epic One Chart/Beaker LIS and Safetrace Tx (LIS). These systems are linked together by a communications interface, commonly referred to as the interface engine.

B. Implementation of downtime procedures is dependent upon which component of the information system is inoperable. Normally, lab orders are instituted in EPIC, and are then transmitted to Safetrace Tx. A failure in the system can have different impacts depending on which component of the Information System is involved. The IT Help Desk (1-888-481-2448) shall be contacted for any issues identified with the computer systems.

C. Various scenarios are described in this document including:

    1. EPIC down/Safetrace up

2. Epic up/Safetrace down
3. Safetrace Instrument Interfaces down.

III. SCOPE:

Blood Bank Personnel at Corewell Hospital - Dearborn, Farmington Hills, Grosse Pointe Royal Oak, Troy.

IV. DEFINITIONS/ACRONYMS:

A. LIS: Laboratory Information System; Epic Beaker
B. HIS: Hospital Information System; Epic OneChart
C. BBIS: Blood Bank Information System; Safetrace
D. RBC: Red Blood Cell
E. Shingle**:** the physical printout that is generated from the HIS when a Blood Bank test is ordered on a patient in the HIS.
F. ISBT: A standard for the identification, labeling, and information processing of blood, cellular therapy, and tissue products

V. OVERVIEW

A. Epic HIS -Beaker LIS Down/ Safetrace BBIS Down

1. Impact of Downtime
    a. Orders can not be placed in Epic.
    b. Order notifications (Epic Shingles) will not print in Blood Bank.
    c. Collection orders will not be received by Epic Rover.
    d. Patient demographic/location information will not be received in Safetrace.
    e. No blood product scanning or clinical documentation of transfusion data will be available in EPIC.
    f. Order and result interfaces between Beaker and Safetrace Instrument Interface Manager (DI) is unavailable.
    g. Electronic Quality Control (QC) documentation for blood bank reagents will not be available.
2. Downtime Plan
    a. Blood Bank will receive manual downtime orders. Samples will be collected and labeled with downtime patient chart labels or Beaker Downtime Labels. Refer to Laboratory Beaker Downtime Procedure.
    b. A folder will be made with the patient's information and the sample will be tested by automated or manual methods.
    c. If testing is performed by automation, results from instrument will be printed out and

placed in patient's folder.

d. If testing is done manually, results will be recorded on the *Patient Downtime Worksheet* and placed in the patient's folder.

e. After Epic becomes available, orders will be placed in HIS/received in Beaker LIS under the correct admission (HAR) for the patient. The sample will then be received in SafeTrace and the results will then be recouped in Safetrace.

f. Reagent QC will documented on downtime QC forms.

B. Epic HIS Down/ Beaker LIS Down/Safetrace BBIS Up

1. Impact of Downtime
    a. Orders can not be placed in Epic.
    b. Order notifications (Epic Shingles) will not print in Blood Bank.
    c. Collection orders will not be received by Epic Rover.
    d. Patient demographics for new admission will not be available in Safetrace.
    e. Patient Locations may be incorrect in Safetrace.
    f. No blood product scanning or clinical documentation of transfusion data will be available in EPIC.
    g. Order and result interfaces between Beaker and Safetrace Instrument Interface Manager (DI) is unavailable.
    h. Electronic QC documentation for blood bank reagents will not be available.

2. Downtime Plan
    a. Samples received in Safetrace BBIS prior to the downtime can be tested as usual, but the results will not interface to Epic until operational.
    b. Samples received after the downtime will be handled as follows:
        i. Blood Bank will receive manual downtime orders. The samples will collected and labeled with patient chart labels or Beaker Downtime Label. Refer to Laboratory Beaker Downtime Procedure.
        ii. A folder will be made with the patient's information and the sample will be tested by automated or manual methods.
        iii. If testing is performed by automation, the barcoded samples will be loaded and test orders will be placed manually on the instrument. Results from instrument will be printed out and placed in patient's folder.
        iv. If testing is done manually, testing will be entered as on the *Patient Downtime Worksheet* and placed in the patient's folder.
        v. After HIS/LIS becomes available, orders and result interfaces will be available. Order/Results should interface to Safetrace and be available for result entry in the BBIS. All test results will then be recouped in Safetrace.

c. Reagent QC will be documented on downtime QC forms.

C. Epic HIS Up/Beaker LIS Up/Safetrace BBIS Down

1. Impact of Downtime
    a. Order notifications (Epic Shingles) will still print in Blood Bank.
    b. Specimens will be still be collected and received using normal Epic Beaker laboratory processes.
    c. Test Orders /Specimen receipts will not interface to Safetrace.
    d. Order and result interfaces between Beaker and Safetrace Instrument Interface Manager (DI) is unavailable.
2. Downtime Plan
    a. A folder will be made with the patient's information and the sample will be tested by automated or manual methods.
    b. If testing is performed by automation, the barcoded samples will be loaded and test orders will be placed manually on the blood bank instrument. Results from instrument will be printed out and placed in patient's folder.
    c. If testing is done manually, testing will be entered on the *Patient Downtime Worksheet* and placed in the patient's folder.
    d. After Safetrace becomes available, orders and result interfaces will be available. The sample will then be received in SafeTrace and instrument results maybe resent to Safetrace and be available for result entry in the Safetrace system. All manual test results will then be recouped in Safetrace.

D. Safetrace Instrument Interfaces Down

1. Impact of Downtime
    a. Order notifications (Epic Shingles) will still print in Blood Bank.
    b. Specimens will be still be collected, labeled and received using normal Epic Beaker laboratory processes.
    c. Test Orders /Specimen receipts will interface to Safetrace BBIS.
    d. Order and result interfaces between Safetrace and Blood Bank Instrumentation are unavailable.
2. Downtime Plan
    a. If testing is to be performed by automation, the barcoded samples will be loaded and test orders will be placed manually on the blood bank instrument. Results from instrument will be printed out and manually resulted in Safetrace.

E. Safetrace Backup Files Down

1. Impact of Downtime

a. The process that is normally used to retrieve historical patient data when the Blood Bank computer system is down can not be used.

b. Blood Bank will be unable to retrieve any of the patient's historical special instructions, with the exception of previous antibody workups/antibody cards (if available).

2. Downtime Plan

    a. If functionality of the back up files cannot be restored and no prior historical information is available from previous antibody workups/antibody cards then the Blood Bank must perform a confirmatory type on every sample since there is no historical record available.

VI. POLICY:

All Transfusion Medicine policies and procedures remain in effect during computer downtimes, with the exceptions noted in this document. The processes, results, and interpretations that are normally documented when the computer is available will be instead documented on downtime forms.

VII. SUPPLIES

All supplies, forms and labels that are required during computer downtimes are found in the designated *Downtime Supplies* bin located in the department.

VIII. PROCEDURE

A. Patient Identification & Specimen Labeling:

1. Inpatient specimens must be properly labeled (at the bedside) and legible with patient first and last name, date of birth (DOB), Medical Record Number (MRN), wristband B number (required), collection date and time, and the identification of the person collecting the specimens.

    a. In instances when downtime registration systems are not able to provide MRN for unconfirmed patients (i.e. unidentified, newborn deliveries, and first time patients to the health system), specimens labeled with patient first and last name, DOB, wristband number, collection date and time, and the identification of the collector will be accepted without the MRN. These patients must be transfused with Group O crossmatch compatible RBCs and A or AB Plasma components in accordance with standard transfusion policies until a full registration and sample collection can occur.

2. Outpatient specimens must be properly labeled and legible with patient first and last name, date of birth, collection date and time. These specimens are not eligible for pre-transfusion specimens and can not be used for crossmatch.

B. Downtime Barcode Numbers

1. The Blood Bank has pre-printed Beaker downtime barcode labels located in the Blood Bank Downtime bin.
2. There are five barcode stickers per number. These labels include only accession numbers; therefore the patient's name and Medical Record Number (MRN) must be handwritten on the downtime labels that are selected for the patient.
3. When routine blood collection/receipt processes in the HIS are not operational, a barcode number will be placed on the sample for testing purposes, to enable blood bank analyzers to identify samples by scanning barcodes.
4. **When affixing a downtime barcode number to the sample, the barcode must be applied in such a way that it does not cover information from the original label.**

C. Historical Record Check

1. When the BBIS is not operational, the backup file of each patient must be accessed if a sample is received, tested or if blood is issued during the downtime.
    a. The question "Backup File Accessed?" on *Patient Downtime Worksheet* will be answered "√ / Tech" to reflect that the backup file has been accessed.
2. In addition, the historical ABORh and any antibodies, special transfusion requirements and/or messages will be documented on the patient's downtime form.
3. Any ABORh discrepancies must be investigated and corrected before a unit is issued for transfusion. If applicable, refer to Transfusion Medicine policy; Resolution of ABO and Rh Discrepancies.
4. In most cases, the backup file is accessed, and the historical information is documented on the downtime form at the time a sample is triaged but in some cases the Backup file is accessed, and the historical information will be documented on the downtime form at a time other than sample triage.

    For example: RBCs are requested on a specimen previously received and tested. The crossmatching technologist does not find a downtime folder so he or she makes one, accesses the Backup file, and documents on *Patient Downtime Worksheet*. The technologist who issues the blood retrieves the downtime folder, sees that the backup files have already been accessed as indicated on the Patient Downtime Worksheet, and uses the information recorded on the worksheet to ensure that the blood product meets all the requirements found in Transfusion Medicine policy, Dispensing Blood Components.

D. Triage: Receiving Samples

1. If Epic Beaker LIS is operational, then all samples will be received in Beaker but the BBIS is down extra accession labels will be printed. One label will be placed on the *Patient Downtime Worksheet* and another on the tab of the downtime folder. Extra labels will be printed and later used for each blood product that is selected for the patient.
2. If Epic Beaker LIS is not operational so that accession labels cannot be generated by the

system, then the Blood Bank shall use the Beaker downtime labels that will be provided by Clinical Pathology to label samples.
Note that these labels include only accession numbers; therefore the patient's name and Medical Record Number (MRN) must be handwritten on the downtime folder, forms, and photocopies of components that are selected for the patient.

E. Downtime Folders

1. A downtime folder will be created for every patient sample received during downtime.
2. All paperwork for a given patient will be placed in the downtime folder, e.g., Epic shingle, downtime test requisition, instrument printouts, patient antibody workups/cards (if applicable) etc.
3. The downtime folder will accompany the patient sample through the Blood Bank as testing is performed; it will be viewed each time that testing is performed or a component is processed or dispensed for the patient.
4. Any new special transfusion requests (as may be indicated on the shingle, downtime test requisition, or dispense form) will also be documented in the space provided on the *Patient Downtime Worksheet.*

F. Instrument Print Outs

1. Instrument printouts will be added to the patient downtime folders and instrument interpretations will be recorded on the *Patient Downtime Worksheet.*
2. Use caution when documenting to make sure that the order numbers on the printouts match the order numbers on the *Patient Downtime Worksheet* and that the printouts are placed in the folders belonging to the correct patients.

G. ABORh Testing

1. If the patient does not have a historical type in the BBIS backup file, then both the ABORh test and the ABORh No Charge test shall be performed.
2. If the patient has a historical type in the BBIS backup file, then the ABORh test is only performed
3. The ABORh test and the ABORh No Charge may be performed by any of the following methods:
    a. Automated Method: Instrument printouts will be added to the patient downtime folders and instrument interpretations will be recorded on the *Patient Downtime Worksheet.*
    b. Tube Test Method: The technologist will document the graded reactions on the *Patient Downtime Worksheet* accordingly and verify that the current ABORh matches the historical record (if applicable).
4. If both the ABORh test and the ABORh No Charge test are indicated (because the patient does not have a historical type) the same technologist may perform both using automated methods but can not perform both if only the manual methods are used. A second technologist is required to confirm all manual test typing on patients with no prior history.

Crossmatching Red Blood Cells

1. During computer downtimes, the Blood Bank will crossmatch all RBCs that are ordered by a patient's physician.
2. An immediate-spin crossmatch must be performed on all patients who require a crossmatch during the downtime, to assess ABO compatibility.
    a. If an electronic crossmatch was performed before the computer downtime, the unit may be issued and it is not necessary to also perform a serologic crossmatch during the downtime.
3. For patients with unexpected antibodies, an AHG (usually gel) crossmatch must also be performed in addition to the immediate-spin crossmatch.
    a. *For example: During a computer downtime, a patient is found to have a positive antibody screen. Anti-E is identified. Both an immediate-spin and a gel crossmatch must be performed.*
4. A photocopy of each RBC that is crossmatched for the patient shall be added to the downtime folder.
    a. If accession labels can be printed from Beaker, then a Beaker label can be placed on the photocopy of each RBC that is crossmatched for the patient.
    b. If accession labels cannot be printed from Beaker, then the patient's name and MRN should be handwritten on each photocopy.
    c. If the crossmatch is performed during the computer downtime, then the product P-tag must be handwritten with permanent ink (no gel pens) or generated electronically using the downtime P-Tag template in Sharepoint.
    d. Before crossmatching, the technologist will verify that the ABORh and ABORh No Charge test (if applicable) were completed, that the antibody screen was completed, and that an antibody investigation was performed, if applicable.
        i. a confirmatory type must be performed at the time of crossmatch, by the technologist crossmatching the RBCs

H. Confirmatory Type

1. During computer downtimes, the patient's blood type must be verified at the time RBCs are crossmatched, by the technologist crossmatching the RBCs. This requirement is met by either the **ABORh No Charge** (NPR) test or the confirmatory test **ABORh Forward** (CONF)
2. The **ABORh No Charge** test may be performed at the same time that RBCs are crossmatched, by the same technologist crossmatching the RBCs.
3. It is not necessary to also perform the confirmatory test if the **ABORh No Charge** is done at the time RBCs are crossmatched, by the technologist crossmatching the RBCs.
4. The confirmatory test must be performed / repeated each time that the sample is retrieved from storage for crossmatching, and each time that a different technologist crossmatches RBCs. The confirmatory test consists of a tube forward typing with Anti-A, Anti-B and Anti-D reagent.

For example:

a. A Type and Screen only was ordered on a patient with no historical record. The Blood Bank performs the ABORh and **ABORh No Charge** and stores the sample in the refrigerator. RBCs are ordered several hours later. The **ABORh Forward** test must be performed at the time RBCs are crossmatched, by the technologist crossmatching the RBCs.

b. A technologist performs the **ABORH Forward** confirmatory test, crossmatches 2 RBCs, and returns the sample to the refrigerator for storage. Several hours later, additional RBCs are requested. The same technologist retrieves the sample and must repeat the **ABORh Forward** test as the additional RBCs are crossmatched.

c. The confirmatory test **ABORH Forward** will be required when preparing platelets, plasma, or cryoprecipitate if compatibility testing was performed before the computer downtime.

d. If the sample is depleted due to multiple confirmatory tests, a new sample should be collected and a new type/screen should be performed on the new sample.

I. Product Modification (Thawing Plasma and Cryoprecipitate, Dividing and Preparing Aliquots, Irradiation)

1. Make a photocopy of the pre-modified face label of the blood product.
2. Do not cover the original product description on this photocopy because it is needed for barcode scanning / recouping data when the system's functionality is restored.
3. Modified components will be labeled with a new product description label that can be found in the binder in the downtime bin along with a job aid that allows the user to determine the correct post-modification code/sticker based on the pre-modification code.
4. Product modifications for Thawing or Irradiation will documented on the *Downtime Product Modification* Form.
5. Product divisions or aliquots will be documented on the routine *Blood Product Division/Aliquot Preparation Log*.

J. Platelet, Plasma, and Cryoprecipitate Preparation for Patients

1. A photocopy of each product that is selected for the patient shall be added to the patient's downtime folder.
2. If accession labels can be printed from the Beaker, then a Beaker label will be placed on the photocopy of each product that is selected for the patient.
3. If accession labels cannot be printed from Beaker, then the patient's name and MRN should be handwritten on each photocopy.

4. The patient's blood type must be determined / tested during the downtime and be documented on the *Patient Downtime Worksheet.*
5. If compatibility testing was performed before the computer downtime, then the **ABORh Forward** confirmatory test must be performed.
6. It is not necessary to perform more than one **ABORH Forward** on a sample for the purposes of providing additional platelets, plasma, or cryoprecipitate.
7. If a platelet, plasma, or cryoprecipitate is requested during a computer downtime, then a Blood Bank sample from the current admission must be available to be retrieved from storage for the **ABORh Forward** test.
8. If the patient does not have a sample available in storage for retrieval (i.e. time has exceeded maximum specimen retention), then a new sample should be collected. It may be necessary to emergency issue components in this case.

K. Dispensing Blood Components

1. When dispensing blood components, the technologist will adhere as closely as possible to Transfusion Medicine policy, Dispensing Blood Components.
2. During computer downtimes the technologist who issues a component must verify that all required compatibility testing is complete and that the component meets the patient's special transfusion requirements.
    a. Verify all patient and unit information is correct on all tags.
    b. Verify the appropriate serological crossmatch has been performed (if applicable).
    c. Verify all special requirements are met.
3. A final check at the time of issuance is required before releasing the unit for transfusion by either:
    a. **Dispensing with Read Back**: The dispensing technologist and the courier / runner picking up the unit will read back the information on the P-tag starting working down the form matching the information between the P-Tag, the hang tag label attached to the unit and the *Product Dispense form* to verify all dispense requirements are met
    b. **Dispensing With Clerical Checks**: If read back is not performed at the time of issue (pneumatic tube issue or emergency issue in cooler) the dispensing technologist must document a check mark (or equivalent mark) next to each dispense requirement to indicate that the dispense requirement has been met.
4. Place a downtime pick-up sticker on the pick-up slip and fill out the date and time of product issue and cooler (if applicable).
5. The photocopy of each dispensed unit (with the patient's accession label or handwritten name and MRN) will be stapled to Blood Bank Product Dispense Form and to the copy of p-Tag and returned to the downtime folder.

L. Antibody Problems / Investigations

1. If any new antibodies are detected or if any additional transfusion requirements are needed

based on the investigation, document these on the *Patient Downtime Worksheet* and the patient's antibody panels/card (if applicable) so that they may be recouped later.

M. Antigen Typing

1. In the case of a Blood Bank computer system downtime the *Antigen Typing Downtime Form* is used to document unit antigen typing. Refer to Transfusion Medicine policy, Antigen Typing for further information.
2. All antigen typing data performed during downtime will be recouped in the computer system when available.

N. Quality Control

1. In the case of a Blood Bank computer system downtime reagent quality control will be documented on downtime QC forms. Refer to site specific Transfusion Medicine procedure, Quality Control of Blood Bank Reagents for these forms.

O. Processing Units

1. *Downtime Unit Receipt and Processing Worksheet* will be used to receive the units into inventory and to document confirmatory testing of RBCs.
2. Two photocopies of each unit will be made: one will be attached to the *Downtime Unit Receipt and Processing Worksheet* and the other will trail the unit through the Blood Bank during the downtime.
3. A copy of the invoice will be stapled to *Downtime Unit Receipt and Processing Worksheet* so that data can be recouped once the computer system becomes available.

P. Result Notification

1. Call all STAT results and component availability to Nursing Stations. Document time/date and person notified for all communication in Safetrace if available or on downtime forms, unit bag tags or on the *Downtime Communication Log* if Safetrace is unavailable.

Q. Suspected Reaction Evaluations

1. The *Suspected Transfusion Reaction Evaluation Form* is used whenever a patient is suspected to have a transfusion reaction. Routinely, a technologist will document the clerical checks on this form, while the sample evaluation and testing is documented in the Blood Bank computer system. During a blood bank computer downtime, the evaluation, testing and instructions from Medical Director will be documented on the form and recouped when the computer system is available.

R. Data Recovery

1. Once the system's functionality is restored, all test results, new special transfusion requirements, antibodies, etc. that were recorded on downtime forms will be recouped in the

computer.

   a. When possible, the actual date and time that the testing or process was performed will be recouped, and the name of the technologist who performed the test or process will be added as a comment.

2. The technologist who is recouping data must be extremely careful to compare information on the downtime paper work with information in the computer.
3. This information includes patient names, order numbers, MRNs, wristband numbers (B#'s), birthdates, downtime barcode numbers, donor numbers, graded reactions and interpretations etc.
4. If a downtime barcode number was used to test the sample on blood bank analyzer the barcode number is not an order number in the blood bank computer system. The analyzer test results must be documented in the patient's record, under the applicable order number from the computer system.
5. The downtime barcode number should be added as specimen comment if applicable.
6. For test that were performed by manual methods, the initials of the technologist who performed the test should be document.

S. Data Integrity Check

1. After each BBIS downtime and after the system functionality has been restored, the Blood Bank shall perform a data integrity check.
2. This check shall be performed immediately after the restoration and will be documented on the attachment *Computer Downtime and Data Integrity Check Form*.
3. The pre-downtime and post-downtime ABORh, antibodies, and special messages of four patients will be compared between the Safetrace Backup file and the live version of SafeTrace.
   a. These four patients will be identified from recent documented antibody investigations and shall include one patient of each of the four ABO types (A, B, O, and AB).
   b. Two patients should be Rh(D) positive and two should be Rh(D) negative.
   c. *The Computer Downtime and Data Integrity Check Form* is documented with the start and end time of the downtime, whether the downtime was scheduled, and the data integrity check / comparisons of these four patients.
   d. If the data from the two sources does not match, the cause must be investigated immediately. If the cause cannot be determined immediately, the Blood Bank must remain on downtime and the Medical Director and/or the supervisor must be notified immediately. Completed forms are stored in designated file/binder.

T. Saving Downtime Records

1. All downtime records including downtime forms, product photocopies, p-tags, dispense forms, the Data Integrity Check Forms, and all other forms will be stored in the supervisor’s office following document retention policies.

IX. REFERENCES:

1. College of American Pathologist, Laboratory General Checklist, current edition.
2. AABB, Standards for Blood Bands and Transfusion Services, current edition.

Attachments

Antigen Typing Downtime Form (rev 08/11/2023)

Computer Downtime Data Integrity Form (rev 07/10/2024)

Downtime Communication Log (rev 07/09/2024)

Downtime Crossmatch Worksheet (rev 07/10/2024)

Downtime Rhig Eval Worksheet rev 07/10/2024

Downtime Unit Receipt and Processing Worksheet (rev 07/10/2024)

Patient Downtime Worksheet (rev 07/10/2024)

Approval Signatures

Step Description	Approver	Date
	Karrie Torgerson: Medical Technologist Lead	Pending
	Teresa Lovins: Supv, Laboratory	7/16/2024
	Kelly Sartor: Mgr, Division Laboratory	7/15/2024
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Applicability

Dearborn, Farmington Hills, Grosse Pointe, Royal Oak, Troy