AABB Standards and How They Apply to Blood Bank Pretransfusion

Lisa M. Button
Lee P. Hanson

Disclosures

Relevant Financial Relationship(s):
Nothing to Disclose

Off Label Usage:
Nothing to Disclose
Objectives

1. Identify AABB BBTS Standards applicable to pretransfusion
2. Evaluate your institution’s compliance with pretransfusion standards and employ methods to meet them
3. Discuss implications and identify risk associated with Non-compliance, including Wrong Blood in Tube (WBIT)

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• 5.11 Samples and Requests
  • Identifying information for the patient and the sample shall correspond and be confirmed at the time of collection using two independent identifiers
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• 5.11.2 Patient Samples
  • Patient samples shall be identified with an affixed label bearing sufficient information for unique identification of the patient, including two independent identifiers
  • 5.11.2.1 – The completed label shall be affixed to the sample container before the person who obtained the sample leaves the side of the patient.
  • 5.11.2.2 – There shall be a mechanism to identify the date and time of sample collection and the individual(s) who collected the sample from the patient.

• 5.11.3 Identifying Information
  • The transfusion service shall confirm that all identifying information on the request is in agreement with that on the sample label. In case of discrepancy or doubt, another sample shall be obtained.
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• 5.14 Pretransfusion Testing of Patient Blood
  • Pretransfusion tests for allogeneic transfusion shall include ABO group and Rh type. In addition, for Whole Blood, Red Blood Cell, and Granulocyte components, pretransfusion testing for unexpected antibodies to red cell antigens shall be performed.

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• 5.14.5 Pretransfusion Testing for Allogeneic Transfusion
  • There shall be two determinations of the recipient’s ABO group as specified by 5.14.1. The first determination shall be performed on a current sample, and the second determination by one of the following methods:
  1) Testing a second current sample
  2) Comparison with previous records
  3) Retesting the same sample if patient identification was verified using an electronic identification system or another process validated to reduce the risk of misidentification
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- 5.14.6 Comparison with Previous Records
  - There shall be a process to ensure that the historical records for the following have been reviewed:
    1) ABO group and Rh type
    2) Difficulty in blood typing
    3) Clinically significant antibodies
    4) Significant adverse events to transfusion
    5) Special transfusion requirements
  These records shall be compared to current results, and any discrepancies shall be investigated and appropriate action taken before a unit is issued for transfusion

CAP TRM requirements

- TRM.40230 Compatibility Specimen Labeling
  - All blood samples used for compatibility testing are labeled in the presence of the patient with:
    1. Patient’s first and last name
    2. Unique identification number
    3. Date of collection
    4. A method to identify the phlebotomist
CAP TRM requirements

• TRM.40670 ABO Group and Rh(D) Type Verification
  • The recipient’s ABO group and Rh(D) type has been verified by repeat testing of the same sample, a different sample, or agreement with a historical type in the laboratory’s records.

How to ensure these standards are met

• Perform self-audits
  • Compare your procedures to AABB BBTS and CAP TRM checklist items
  • Identify areas you can strengthen

• Perform tasks as written

• Document, document, document

• Track and trend noncompliances
  • Set a threshold and act when you cross it
Types of Pretransfusion Noncompliance Events

- Missing information
- Miscollected
- Mislabelled
- Unlabelled
- Illegible
- Patient identification protocol not followed

Tracking Noncompliance

- Important
- What is measured can be managed
- Data supplies information that can be used to garner support for action
Pareto Chart

Control Charts
Risk of ABO Incompatible RBC Transfusion

- In a study published in 2014 in the British Journal of Haematology, Bolton-Maggs reports that 1 in 600,000 transfusions results in death due to ABO incompatibility
  - In the UK: Risk of ABO incompatible RBC transfusions is 1:263,157

Wrong Blood in Tube (WBIT)

- WBIT Deaths
  - 19 deaths in 17 years in the UK
    - 15 deaths between 1996 – 2004
    - 4 deaths between 2006 – 2013
- Other Risks of improper identification
  - Patient may get a transfusion they don’t need
  - Patient who needs a transfusion may not get the transfusion or it may be delayed
  - If identified – will require a redraw
Factors Contributing to WBIT

- Patient Registration
  - Estimated that 5%-10% of ABO mismatches were related to registration errors
- Positive Patient Identification
  - Don’t label samples after you’ve left the patient’s bedside
  - Electronic Checks
  - Asking, not prompting, the patient for name and date of birth
  - Critical tasks – ID check was omitted, incorrectly performed or not performed at all

Pre-Analytic Errors

- In a UK study by Varey et al (2013), they found that in cases of WBIT, when a doctor performed phlebotomy, rather than a phlebotomist, the doctor was more often responsible for collecting the WBIT sample
  - 22% doctor
  - 5% phlebotomist
- Another study in 2013, by Bolton-Maggs, states that phlebotomy performed by a doctor and failure to label the sample at the bedside (44.2% and 45.9% respectively) were responsible for 90.1% of all WBIT events
Pre-Analytic Errors

- Risk for WBIT is high in areas with neonates, pediatrics, and high patient turn-over (ED, radiology, OR, labor and delivery)
  - Patient ID band was removed or never put on
  - Sample labels were pre-printed, not used, left behind and then applied to the next patient’s samples inadvertently
  - Offer of “help” from a colleague to label a sample that you collected

Human Factors

- Interruptions
- Distractions
- Fatigue
Best Practices to prevent WBIT

- Two independently collected samples to test for ABO
  - If hospital has an electronic ID system – 1 sample
- Dedicated phlebotomy team
- Label the sample at the bedside

Real Life Examples - #1

- A hospital requires two separate ABO sample venipunctures.
  - Two samples were collected at the same time (during the same venipuncture), but were labeled as if they had been collected at independent venipunctures.
  - The patient wasn’t properly identified, so although the lab had two samples to test ABO, and both samples were the same blood type – the process safeguards were skirted and the second check on blood type did not provide the safety net it was intended to
Real Life Examples - #2

• In a busy Emergency Department, a nurse collected samples from two patients that were roomed next to each other
  • The nurse did not label the samples before she left each patients’ bedside
  • The labels had been pre-printed, so the nurse returned to the nursing station and labeled the samples she collected by memory
  • The patient labels were mixed up (label for patient #1 ended up on sample from patient #2 and vice versa)
  • This mix-up was detected because one patient had a previous ABORh on file

Real Life Example - #3

• During the registration process, a confused patient was unable to positively identify themselves
  • Registration employee chose the wrong patient, with a similar name and the same date of birth from their system
  • Type and Screen sample was drawn
  • Lab tested it and the ABO of the confused patient matched the ABO on file of the patient whose record they were registered under
    • However, patient on file had a known antibody, but this sample drawn from the confused patient did not have a positive antibody screen and it let testing lab to question the sample
Real Life Example - #4

• An injured male, without health insurance, borrowed their brother’s insurance card and proceeded to the Emergency Department for care
  • Injured male registered as if he were his brother
  • Samples were drawn and testing in the lab showed that the ABO on file did not match the ABO drawn from the patient today
  • WBIT investigation enacted to determine source of blood typing discrepancy

CAP Q Probe

• Q1 2015
• probe tallied the number of labeled and WBIT ABO blood typing specimens
• 30 institutions participated
  • Participants submitted data on 41,333 specimens
    • 7.4 per 1000 samples were mislabeled
    • 0.43 per 1000 samples were WBIT
CAP Q Probes – 2007 and 2015

- Novis, et al in 2017 compared the data from the 2007 and 2015 Q Probes and found no statistically significant difference between the rates of mislabeled or WBIT samples
- The widespread adoption of barcoding did not decrease instances of mislabeling
- Surprised by findings, thought that advances in technology would improve safety of the process.
  - Human factors were not completely removed and choices to bypass safeguards played a role both in 2007 and 2015

References

1. Standards for Blood Banks and Transfusion Services, 31st Edition, AABB, Bethesda, Maryland
Questions & Discussion