Advancing Transfusion and Cellular Therapies Worldwide

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To: AABB Members

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Re: Monitoring and Preventing the Occurrence of Deviations and Near-Miss Events in Pretransfusion Testing: Mislabeling/Wrong Blood in Tube

Summary
The 35th edition of *Standards for Blood Banks and Transfusion Services*[1] requires transfusing facilities to monitor deviations and nonconformances (Standard 7.0). Facilities are also required (Standard 8.5) to have a peer review program that monitors, among other issues, patient identification, sample collection and labeling, and near-miss events. This Association Bulletin provides information to transfusion services on a particularly important and common type of issue associated with pretransfusion testing: the procurement and use of a patient specimen labeled with another individual's name/identification number, referred to as "wrong blood in tube" (WBIT).

Background
A mislabeled blood specimen generally is defined as one whose labeling does not meet the local institutionally defined criteria for accessioning into the laboratory. Common examples include misspelled last names, a missing or incorrect medical record number, or mismatched information between the specimen and the requisition. Such specimens are not suitable for pretransfusion compatibility testing and the errors associated with them underscore the importance of positive patient identification at the time of sample collection and labeling for safe transfusion. Guidance on specimen labeling is available in the AABB publication *Guidelines for the Labeling of Specimens for Compatibility Testing*.[2]

A subset of mislabeling is the problem known as WBIT, where an apparently properly labeled tube identifying blood from one patient actually contains blood from another.[3] This type of event is most often recognized when the ABO/Rh result of the current sample is compared with the historical record on file for the patient. One study that examined prospectively all rejected mislabeled specimens and also noted all discrepant serologic results from "appropriately labeled" samples found that specimens with an

obvious labeling error are much more likely to contain WBIT.[4] More recent review of FDA fatalities associated with ABO incompatible red cell transfusions show that WBITs, though decreased in frequency, remain one of the most common causes. In all reviewed cases, verification of the ABO type with a second sample or historic type was not performed[5].

Incidence of WBIT

Mislabeled specimens, including WBIT, continue to occur frequently despite improved identification systems. Recent international data demonstrates aggregate unadjusted WBIT rates of approximately 1 in 10,000 samples[6], with adjusted rates (accounting for silent errors in new patients and ABO-identical misidentifications) ranging from 1 in 3,000 to 1 in 14,600 depending on identification methods used[7]. UK national audit data from 2022 shows WBIT rates of 1 in 5,882 samples.[8] Among mislabeled (rejected) specimens, WBIT rates remain substantially higher at approximately 1 in 71 samples (unadjusted) or 1 in 28 (adjusted), reinforcing the critical importance of strict specimen rejection policies.

Electronic positive patient identification (ePPID) systems have emerged as the most effective intervention for reducing WBIT errors. Studies demonstrate that ePPID systems, which typically involve scanning patient wristband barcodes before specimen collection and printing labels at the bedside, reduce WBIT errors by approximately 5-fold compared to manual identification methods.[7] When combined with independent dual verification processes, institutions can achieve greater than 10-fold reductions in WBIT events.[9] However, ePPID does not eliminate all WBIT errors, as protocol violations and improper use of electronic systems still occur. Analysis of WBIT cases reveals that the most frequent contributing factor is having another patient's labels or tubes available during phlebotomy (61% of cases), with most errors involving a combination of protocol violations and slips/lapses (53%).[10]

Identified cases of WBIT represent only a subset of the true number of WBIT events because new patients with no historical record are not captured and two misidentified patients who share the same blood group by chance are also not captured. Correction factors to account for these two variables may be used to obtain the true WBIT rate from the raw number of WBIT cases identified.[3]

Conclusion

Identifying the frequency of deviations such as WBIT events fulfills requirement to monitor quality indicators and nonconformances as specified in current AABB Standards[1] and improves the safety of transfusion practices. These monitoring requirements align with the Joint Commission on Accreditation National Patient Safety Goals (effective January 2026) requiring use of at least two patient identifiers when collecting blood samples and labeling containers in the presence of the patient.[11]

Because transfusion services are already required to check historical blood bank records, any case in which the blood group information does not match the current sample should be identified and investigated. Tracking these events and root cause analyses will help develop a corrective action plan to prevent future occurrences. Determining the magnitude of the WBIT specimen problem in an institution is an important step toward

the ultimate goal of improving transfusion safety.

Transfusing facilities should take steps to monitor and prevent the occurrence of WBIT. Guidance, including recommendations for monitoring and preventing WBIT, is available in the AABB publication *Guidelines for the Quality Assessment of Transfusion*.[12]

References

1. Noone S, ed. Standards for blood banks and transfusion services, 35th edition. Bethesda, MD: AABB, 2024.

2. Rossmann SN for the Scientific Section Coordinating Committee. Guidelines for the labeling of specimens for compatibility testing. Bethesda, MD: AABB, 2002.

3. Dzik WH. Emily Cooley lecture 2002: Transfusion safety in the hospital. Transfusion 2003;43:1190-9.

4. Lumadue JA, Boyd JS, Ness PM. Adherence to a strict specimen-labeling policy decreases the incidence of erroneous blood grouping of blood bank specimens. Transfusion 1997;37:1169-72.

5. Storch EK, Rogerson B, Eder AF. Trend in ABO-incompatible RBC transfusion-related fatalities reported to the FDA, 2000-2019. Transfusion 2020;60;2867-75.

6. Dunbar NM, Delaney M, Murphy MF, Pagano MB, Saifee NH, Seheult J, Yazer M, Kaufman RM; WBIT Study Investigators on behalf of the Biomedical Excellence for Safer Transfusion (BEST) Collaborative. Emergency departments are higher-risk locations for wrong blood in tube errors. Transfusion. 2021 Sep;61(9):2601-2610.

7. Kaufman RM, Dinh A, Cohn CS, Fung MK, Gorlin J, Melanson S, Murphy MF, Ziman A, Elahie AL, Chasse D, Degree L, Dunbar NM, Dzik WH, Flanagan P, Gabert K, Ipe TS, Jackson B, Lane D, Raspollini E, Ray C, Sharon Y, Ellis M, Selleng K, Staves J, Yu P, Zeller M, Yazer M; BEST Collaborative. Electronic patient identification for sample labeling reduces wrong blood in tube errors. Transfusion. 2019 Mar;59(3):972-980.

8. Booth C, Davies P. Transfusion sample mislabelling and wrong blood in tube in the UK: Insights from the national comparative audits of blood transfusion in 2012 and 2022. Transfus Med. 2025 Feb;35(1):41-47.

9. Passwater M, Huggins YM, Delvo Favre ED, Mukhtar F, Pelletier JPR. Adding Automation and Independent Dual Verification to Reduce Wrong Blood in Tube (WBIT) Events. Am J Clin Pathol. 2022 Aug 4;158(2):212-215.

10. Dunbar NM, Kaufman RM; WBIT Study Investigators, The Biomedical Excellence for Safer Transfusion (BEST) Collaborative. Factors associated with wrong blood in tube errors: An international case series - The BEST collaborative study. Transfusion. 2022 Jan;62(1):44-50.

11. National Patient Safety Goals Effective January 2026 for the Laboratory Program https://digitalassets.jointcommission.org/api/public/content/3c7a110c215943bc80d9ce87e9d9ee9d?v=aef80e14&_gl=1*hmaghl*_gcl_au*MTk1MzQ4MzcxMC4xNzY3NzYwMjIx*_ga*MTYyNDU4MDMzMi4xNzY3NzYwMjI3*_ga_K31T0BHP4T*czE3Njc3NjAy

MjckbzEkZzEkdDE3Njc3NjE4ODYkajYwJGwwJGg (accessed March 2026)

12. Nichols T, Chanez T, Harach M, et al for the Transfusion Medicine Section Coordinating Committee. AABB Guide to the quality assessment of transfusion. Bethesda, MD: AABB 2021.