

Clinical Pathology Improvement Program (CPIP)
2024 CPIP-E Case 5: Transfusion Medicine – ABO Discrepancy

Erratum for 2024 CPIP-E Case 5: Transfusion Medicine – ABO Discrepancy

Multiple-Choice Question #3 contained incorrect ABO typing results for the patient in the question.

The original, incorrect table was:

Table 1: Patient's ABO typing results.

Front Typing	Anti-A	Anti-B	Anti-D		Back Typing	A1	B
Original Typing	0	4+	4+		Original Typing	0	0
Repeat	0	4+	4+		Immediate Spin	0	0

Table 1 should have contained the following correct test results:

Table 1: Patient's ABO typing results.

Front Typing	Anti-A	Anti-B	Anti-D		Back Typing	A1	B
Original Typing	3+	0	3+		Original Typing	2+	4+
Repeat	4+	0	4+		Immediate Spin	2+	4+

The corrected question, with its answer choices and feedback, appear on the following pages in their entirety.

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Question 3

You are a staff pathologist covering the transfusion medicine service in a community hospital located in a suburban city. A 30-year-old woman, G5P4, is scheduled for elective cesarean section the following week. A specimen for type and screen was sent to the blood bank. Your blood bank technologist discusses the following blood typing results with you (**Table 1**).

Table 1: Patient's ABO typing results.

Front Typing	Anti-A	Anti-B	Anti-D		Back Typing	A1	B
Original Typing	3+	0	3+		Original Typing	2+	4+
Repeat	4+	0	4+		Immediate Spin	2+	4+

What is the most likely cause of the patient's ABO discrepancy and its method of resolution?

- A. Immunosuppressive therapy, resolved by 15-30 minutes incubation at room temperature.
- B. Non-A1 subgroup, resolved by patient's red cells reactivity with *Dolichos biflorus* and confirmed by the patient's serum reactivity with group A1 red cells, A2 red cells, and O red cells.
- C. Patient's age, resolved by 15-30 minutes incubation at room temperature.
- D. Recent transfusion of group A plasma.

Correct Answer

B

Feedback

The correct answer is B. When investigating unexpected positive reaction in the front or back type, the stronger reactivity is more likely to be accurate. Consider the weaker reactivity (of patient's red cells or plasma, respectively) as possibly being reactive due to the underlying cause of ABO discrepancy. Some of the common causes of unexpected positive reaction on back typing include reactivity due to anti-A1 in patients with non-A1 subgroup, cold autoantibodies, anti-M IgM antibodies, or nonspecific plasma proteins.

In this patient, an appropriate next step is:

- Patient's red cells typing with *Dolichos biflorus*
- Patient's plasma typing with group A1, A2, and O red cells



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Anti-A1 is mostly IgM acting at room temperature. However, it is considered clinically significant if it is IgG reacting at 37 °C. Group A2 patients having anti-A1 reacting at 37 °C should be transfused group A2 or group O red cells. Group A2B patients having anti-A1 reacting at 37 °C should be transfused group A2, A2B, B, or group O red cells. However, many transfusion medicine physicians prefer a conservative approach for such patients and issue group O red cells, without testing the serum's reactivity at 37 °C. In this case, the patient's red cell typing with *Dolichos biflorus* was non-reactive. The serum was reactive with A1 cells but was non-reactive with A2 cells and O cells (**Table 2**). Therefore, the patient was non-A1 subgroup of A with anti-A1. She was issued crossmatch compatible group O red cells.

Table 2: Anti-A1 testing in group A subgroups.

Reagent Red Blood Cells	Patient's Plasma Reactivity
A1 cells	2+
A2 cells	0
O cells	0

Unexpected negative reaction on back typing is resolved by 15-30 minute incubation at room temperature. Children less than three to six months old generally have undetectable ABO antibodies on back typing and their reactivity may be enhanced by 15-30 minutes incubation at room temperature. Patients with recent transfusion of group A plasma may have anti-B (and not anti-A) on their back typing.

Objective(s)

(1) Define ABO discrepancy in pretransfusion testing. (2) List and describe the common causes of ABO discrepancy. (3) Outline and interpret the immunohematologic methods of resolving ABO discrepancy.

