



Introducing the balanced scorecard model to improve the timeliness of blood culture final reports

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Introduction:

Blood transfusion safety is an important aspect of patient safety. All blood transfusion procedures are aimed to prevent any risk during transfusion. According to the WHO Clinical Transfusion Practice Guideline(Fig1/2), as blood products are brought from a blood bank, blood transfusion should commence within 30 minutes and end within 4 hours. After 4 hours the blood products will be at risk of hemolysis or bacterial growth, and therefore they should be discarded and the transfusion should be stopped. Given to this, increasing the rate of completing transfusion within 4 hours is critical for improving transfusion. process.

Table 2: Duration times for transfusion

Blood products	Start transfusion	Complete transfusion
Whole blood / PRBC	Within 30 minutes of removing from refrigerator	≤ 4 hours <i>Discard unit if this period is exceeded</i>
Platelet concentrate	Immediately	Within 30 minutes
FFP	As soon as possible	Within 30 minutes
Cryoprecipitate	As soon as possible	Within 30 minutes

Fig 1: WHO Clinical Transfusion Practice Guideline

'30-minute / 4-hour rule' for red cells

- Blood should be commenced as soon as it arrives in the clinical area (after pre-transfusion checks)
- Blood returned to Blood Bank, or signed back into the Blood Fridge within 30 minutes of issue may be returned to stock
- Blood that has remained in the clinical area for more than 30 minutes cannot be returned to stock, but **MAY STILL BE TRANSFUSED** to the patient if the total transfusion time is **WITHIN 4 HOURS**

Fig 2: Blood Management and Transfusion Practice Handbook

Methods:

1. Problems occurring during the running of the blood transfusion record program are analyzed and addressed by implementing the Plan-Do-Check-Act (PDCA) management method.

2. To monitor every relevant procedure effectively, a field for blood retrieval time is added to the blood transfusion record program

3. It controls and reminds that the request should be changed to singleunit (250ml) transfusion when slow transfusion is adopted

Results:

The slow transfusion program controls that single-unit (250 ml) RLPR transfusion is always adopted for patients who receive slow transfusion to ensure that the transfusion is completed within 4 hours. With the information system and the blood transfusion committee reviewing and improving the process, from January to October 2023, the rate of blood transfusion completed within 4 hours has been improved from 98.2% to 99.9% with an average of 99.3%.(Fig 3/4)

M/Y	2018	2019	2020	2021	2022	2023
1	99.5	99.1	97.8	99.5	99.0	99.0
2	99.5	99.7	99.4	99.2	99.4	99.0
3	99.8	98.7	99.2	99.8	99.3	99.1
4	100.0	98.3	99.6	99.8	99.2	99.7
5	99.6	99.0	99.4	99.0	98.7	98.9
6	99.2	99.6	99.5	98.4	98.7	99.4
7	99.6	99.3	99.9	98.4	99.4	99.3
8	99.0	98.9	99.2	99.3	99.2	99.2
9	99.2	99.2	99.5	99.3	99.4	99.2
10	99.8	98.2	99.1	99.9	99.2	99.9
11	99.8	99.0	98.9	99.4	99.5	99.2
12	100.0	98.4	99.9	99.1	99.8	99.3

Fig 3: the rate of transfusion completed within 4 hours

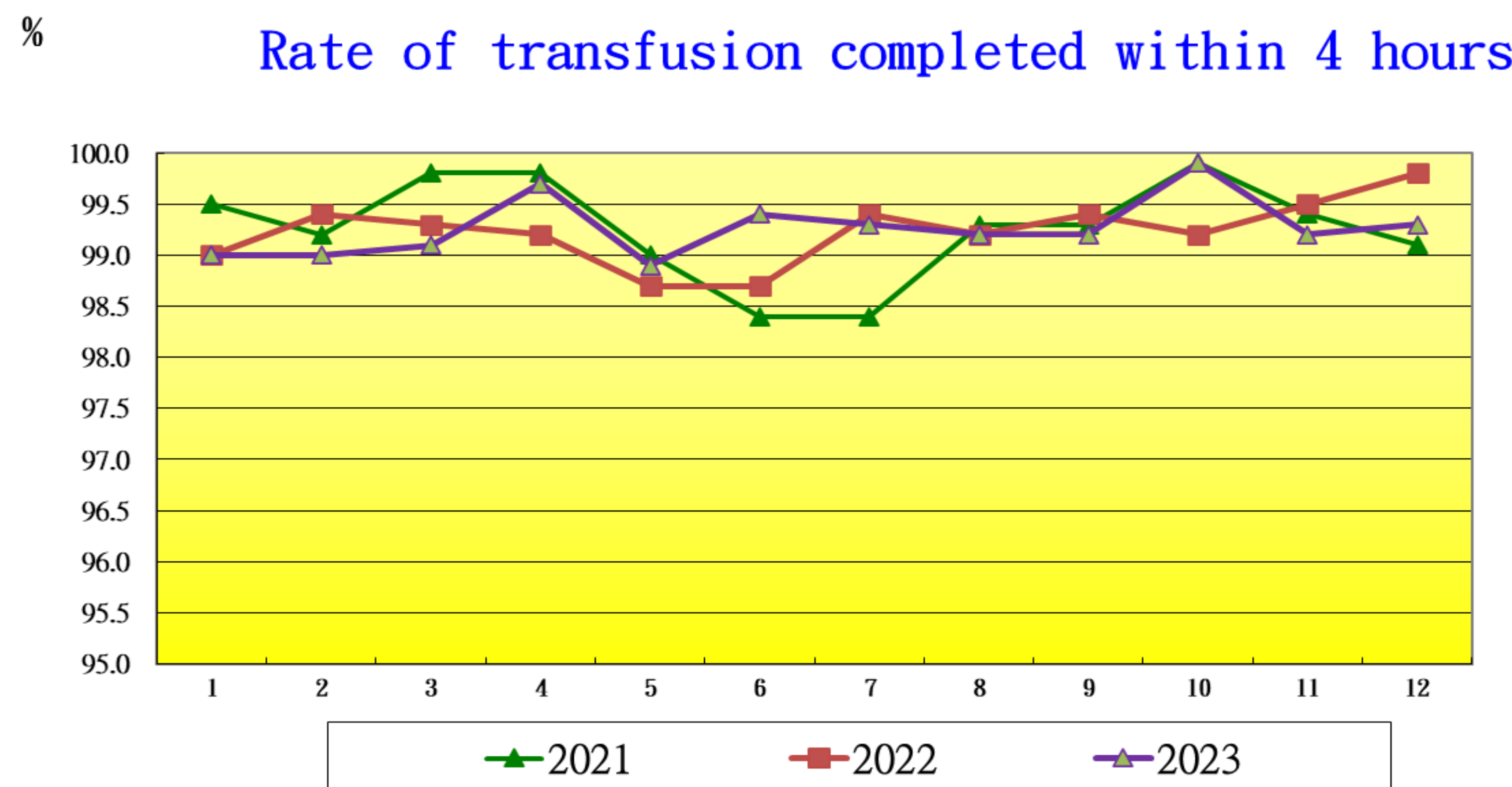


Fig 4: the rate of transfusion completed within 4 hours

Conclusion:

The implementation of the improvement plans is successful. The rate of transfusion completed in 4 hours meets expectation by 99.9%. However, an unsolved problem is that the blood bank has less than 20 bags of AB+RLPR and all the blood products in stock are double-unit (500 ml), so blood products cannot be distributed immediately and last-minute requests for blood from other blood banks are required. The process will be revised to include preordering some singleunit (250ml) AB+RLPR for reserve.