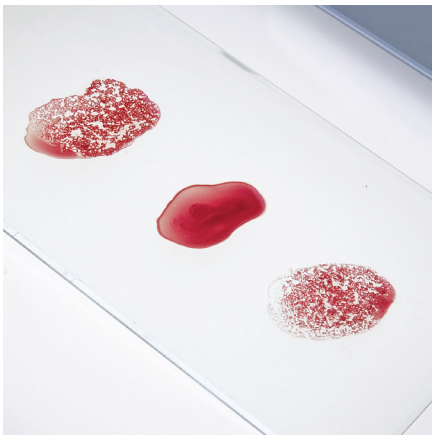
QUOTIENT
BIODIAGNOSTICS

For less than 65¢ and 2 minutes time per donor, a blood center can get better donor yield.



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THESIS:

That for less than 65¢ and 2 minutes time per donor a blood center can get better donor yield from its mobile site collection by conducting a simple, non-test of record ABO slide type on each donor. Using Quotient ABO reagents via a slide technique, a donor center can better manage component collection to maximize inventory, reduce wastage and reduce need for imported blood.

Outlined below are two scenarios that though hypothetical, are driven by statistics from an actual donor center.

Key statistics behind scenarios:

- Up to 90% of donors at mobile sites and up to 60% of donors at fixed sites are first time donors with no prior ABORh history
- In some cases, as few as 30% of new donors come back
- Nationwide, there is a critical need to maximize O- RBCs and AB plasma donations
- Nationwide, there is a glut of A RBCs

Let's consider a couple of scenarios where collection centers have ability to collect double RBCs on mobile drives.

SCENARIO #1

Without Donor Triage

In this scenario, the ability to fill inventory needs is dependent on the presenting donors' blood types rather than a systematic strategy of specific collection of products to meet inventory needs.

Acme Blood Center reviews its inventory and identifies that it needs:

- 18 units of "A" packed RBCs
- 20 units of "B" packed RBCs
- 60 units of "O" packed RBCs
- 2 units of "AB" packed RBCs

As a result, ACME sends four mobile units to blood collection drives at the 4 local high schools. The senior class is getting community service credit for donating blood, thus after deferrals and collection problems, there are 25 potential donors ready and waiting at each site for a total of 100 donors, all of whom are first-time donors.

If we use one center's known statistics that ~13% of donors are willing to go on automation at a mobile drive, then ACME would collect 86 whole blood units and 14 double RBC donations for 26 units without consideration of blood type. Assuming an average US distribution of blood types, ACME would end the drive with:

TYPE	WB UNITS	DOUBLE RBC	RBC TOTAL	NEEDED	USABLE	EXCESS/ SHORTAGE	PLASMA
A	35	5	45	18	**18**	**+27**	**35**
B	9	2	13	20	**13**	**-7**	**9**
O	39	6	51	60	**51**	**-9**	**39**
AB	3	1	5	2	**2**	**+3**	**3**
TOTAL	86	14	114	100	**84**	—	**86**

As the table above shows, this matches demand as follows:

- 45 "A" RBC units collected when only 18 were needed
- 13 "B" RBC units collected when 20 were needed
- 51 "O" RBC units collected when 60 were needed
- 5 "AB" RBC units collected when only 2 were needed
- 86 units of plasma collected from whole blood

Based on this simple example, then ACME would have been able to meet 84% of the RBC demand needs (value $21,000[1]), have 86 units of WB PF-24 (value $4,472[2]) for total value of $25,472, but be stuck with a potential wastage of 27 "A" and 3 "AB" RBC units and have the cost to import 16 units from elsewhere.

[1]84 units times average of $250 per RBC unit
[2]86 units times average of $52 per PF-24 plasma units

SCENARIO #2

With Donor Triage

Now assume the exact same scenario, with same needs, but in this case each mobile drive uses a non-test of record ABORh slide type to determine each donor's type prior to donation. For less than $0.65 per donor and two minutes of testing time, techs now know what each donor's blood type is and can try to direct donors to donate based on need.

Now based on one center's actual experience they are able to get up to 25% of new donors to donate double RBCs instead of whole units when desired. Therefore, they change their collection yield as follows:

- Makes sure none of the 40 "A" donors donate double RBCs
- Gets 5 of the 11 "B" donors to donate double RBCs
- Gets 21 of the 45 "O" donors to donate double RBCs
- Makes sure none of the "AB" donors donate double RBCs

Then the collection of components would break out as shown in the table below.

TYPE	WB UNITS	DOUBLE RBC	RBC TOTAL	NEEDED	USABLE	EXCESS/ SHORTAGE	PLASMA
A	40	0	40	18	**18**	**+22**	**40**
B	6	5	16	20	**16**	**-3**	**6**
O	24	21	66	60	**60**	**+6**	**24**
AB	4	0	4	2	**2**	**+2**	**4**
TOTAL	74	26	126	100	**96**	—	**74**

Now at the end of the day, ACME's usable collections are:

- 18"A" RBC units, same as first scenario but reducing excess RBCs by five
- 16 "B" RBC units, increasing RBC units by three (23%)
- 66 "O" RBC units, increasing O RBC units by 15 (29%), not even controlling for Rh-
- 2 "AB" RBC units, same as first scenario but reducing excess RBCs by one and gaining one plasma unit, and
- 74 plasma units from whole blood

Based on this simple example, ACME would have been able to meet 96% of the RBC demand needs (value $24,000[3]), have 74 WB-PF24 units (value $3,848[4]) for a total value collected of $27,848 and have to import only 3 units.

In this example simply by changing the mix of who donates double RBCs, Donor Triage via slide typing increased the value of what they collected by $2,376 (9.4%).

[3]96 units x $250 per unit
[4]74 plasma units x $52 per unit

Now consider if plasma apheresis is available at a mobile drive:

If 10 of the "A" donors and two of the "AB" donors can be guided to automation, then RBC needs are still met, but now plasma yield is better. Assuming a collection drive can change:

- 10 units of wasted "A" RBCs into 10 extra units of plasma
- 2 units of wasted "AB" RBCs into 2 extra units of plasma

This adds another $624[5] in value from the same collection. This brings the total value of the day's collection to $28,610, an increase of $3,000 or 11.8% over the "blind" collection method, on just $63.00 investment. Factoring in the reduced cost for imported additional units to meet demand shortfall boosts value even more.

Donor Triage benefit to fixed sites

The examples and scenarios above have all dealt with getting more value out of a blood centers' mobile drives using a quick slide typing technique to do Donor Triage. However, this technique can also be used effectively at fixed sites with new donors.

Now, imagine the last example where 22 "A" donors and 2 "AB" donors were essentially donating unusable RBCs, but instead these donors are at a fixed site that has platelet apheresis available. If a center knows beforehand that a new donor's RBCs are not needed, and can get them instead to donate via platelet apheresis you will gain and incremental $500 for each single donor platelet unit collected.[6]

Benefits of Donor Triage based on ABORh typing

Thus, for the cost of 300 drops of antisera ($36) and 100 polystrene welled slides ($27), a donor center can triage its donors to best match demand and facilities available.

Simply being able to better direct donors to:

- Double RBC collection can increase the value of collections by 9.4%
- Double RBC and plasma apheresis can increase the value of collections by 11.8%
- Double RBC and platelet apheresis, still allows a center to meet RBC needs, but dramatically increase value of collections as every "wasted" RBC donor who now donates via platelet apheresis increases value by $500 per single donor platelet unit

This benefit is gained for less than $65 investment per hundred donors, plus limited additional time in new donor interviews. In addition, because this is non-test of record, there is no increase in quality control or proficiency testing requirements.

[5]12 units of "A" plasma x $52 per unit
[6]$500 per single donor platelet

ABOUT QUOTIENT BIODIAGNOSTICS

Quotient Biodiagnostics is a leading transfusion products company built around the research and manufacturing expertise of its subsidiary, Alba Bioscience. Alba was originally established in Scotland in the 1940s as part of the Scottish National Blood Transfusion Service to manufacture blood typing reagents. In addition to supplying its products throughout the Scottish National Health System, the company grew and expanded its offerings as an OEM (Original Equipment Manufacturer) supplier to the world's leading transfusion diagnostics companies. In 2007, it was privatized and became part of Quotient Biodiagnostics.

Quotient Biodiagnostics' primary strategic focus is to provide top quality, blood banking reagents directly to the manual user worldwide. Since 2009, Quotient has built a direct commercial infrastructure in North America, United Kingdom and South America, while Alba Bioscience continues to serve the OEM market. Quotient has over 200 products it manufactures and sells worldwide in over 30 countries.

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