Methods used to screen blood donors for anemia

An Australian has been trying to find out how blood banks in the United States determine a donor's hemoglobin prior to donation. She wonders if the blood collection centers use a copper sulfate screening method or if an actual pre-donation hemoglobin is determined with a device such as the Hemocue. In addition to the information available in an earlier discussion on this forum she hopes that colleagues will respond to this informal survey.

The discussion below is in response to the question posed to the e-network. To 'jumpstart' responses and provide a structure for better analyzing responses, we asked members of the forum to respond to a small **survey**:

> "Colleagues who work in the United States at institutions where whole blood donations are collected are encouraged to submit data for the following survey:
>
> A. **Which test** do you use for primary screening of whole blood donors for anemia?
>
> 1. CuSO4 (copper sulfate)
> 2. Hemoglobin using HemoCue or comparable test
> 3. Hematocrit using Hematostat or comparable test
>
> B. Please identify the **primary function** of your organization
>
> 1. Transfusion Service
> 2. Regional Blood Center"

What follows are several replies and survey results (**UPDATED & FINAL** Nov. 19, 2002)

Twenty-five **Regional Blood Centers** reported on their policy of screening donors for adequate hemoglobin or hematocrit prior to donation.

- 15 of the donor centers screen their donors initially with CuSO4. Of these centers, 9 mentioned that CuSO4 failures were confirmed using one of the following methods: a microhematocrit centrifuge (3 centers), a HemoCue (3 centers) or a HematoStat (3 centers). One center using the HematoStat limits that device to failed CuSO4 results from whole blood donors; they use a microhematocrit centrifuge for apheresis and autologous donors.
- The remaining 10 donor centers were evenly split between screening donors with a HemoCue or comparable device (5 centers), or a HematoStat or comparable device (5 centers).

Fifteen hospital-based **Transfusion Services** that also collect blood donations reported on their policy of screening donors for adequate hemoglobin or hematocrit prior to donation.

- 2 of the hospital services screen their donors with CuSO4. Of these, 1 mentioned that CuSO4 failures were confirmed using a HemoCue.
- Of the remaining 13 hospital services, 10 reported using a HemoCue or comparable device, 2 reported using a microhematocrit centrifuge, and one reported using a hematology analyzer.

These results are not surprising. Regional Blood Centers, because they screen larger numbers of donors, most of whom are at mobile collection sites, tend to use a primary screening test such as CuSO4 that is inexpensive and easy to administer by non-technical personnel. The opposite is the case for Transfusion Services based in hospitals.

In addition to the USA policies reported above, the following approach was reported (by the Chair of the UK Standing Advisory Committee on the Care and Selection of Blood Donors) to be in place in the **United Kingdom:**

Finger-stick samples of freely flowing blood are screened via following methods

- CuSO4 SG 1053 for female donors (equiv. to Hgb 12.5g/dL)
- CuSO4 SG 1055 for male donors (equiv. to Hgb 13.5g/dL)

Donors whose finger-stick samples **fail the CuSO4 screen** are invited to have a **venous** sample taken (most donors agree to this)

- Follow-up samples are tested on-site by a HemoCue; the following working day the same sample is tested at a base lab by an automated cell counter
- All labs participate in the UK FBC NEQAS exercise
- females accepted if HemoCue Hgb >12.0g/dL
- males accepted if HemoCue Hgb >13.0g/dL
- HemoCue devices are regularly checked, and the on-site performance checked by comparison with the automated cell counter result at the base lab.

Using the above UK scheme, the responding blood banker reports that a few anemic donors get bled, but only very occasionally.

In addition to discussing what method is used to screen hemoglobin levels before donation, **a blood banker from Maryland** wanted to know what donor centers use for an **upper** limit for hemoglobin/hematocrit to accept a donor? His donor center is concerned over screening potential donors with hematological problems and referring them for appropriate medical evaluation. He could not find any upper limits identified in the standards or in the medical literature. He is interested in policies that are in place at other facilities to guide this practice.

Finally, a physician reported **an interesting observation when using a HemoCue device for qualifying repeat donors for platelet apheresis collections**. According to the responding physician, they do a hemoglobin screen with a HemoCue, and if the donor's hemoglobin passes, the donor is put on the machine. However, at the beginning of the platelet collection procedure a blood sample is sent to the lab for a CBC (including platelet count), and this testing is done on a Coulter device. However, the **hemoglobin determined by the Coulter has routinely trended lower than that obtained by the HemoCue**. In one case a donor qualified via HemoCue but the Coulter hemoglobin result came back at 11 g/dL. The responding physician contacted the HemoCue manufacturer and based on that discussion, he is of the opinion that the HemoCue device has a CV of 10 - 12%. In response to a CV of 10-12%, the responding physician has adjusted upwards to 12.7 g/dL the qualifying hemoglobin level when screening platelet pheresis donors using a HemoCue. After six months they evaluated the number of donors they were losing. This amounted to about 5 per month, and not surprisingly all were females. Since their donor population is predominantly male this has not been a major problem, and in the opinion of the donor center physician, it avoids the problems of collecting donors that should be disqualified or stopping collections once they've begun.

Please submit comments to the e-Network Forum.

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