MEDICINE

# Bankruptcy For Blood Banks

**The war emergency is over, but people still need blood. Although plasma is still used, nothing takes the place of whole blood.**

By JANE STAFFORD

➤ LITTLE more than a year ago millions of Americans were proud and eager to give their blood to the Red Cross, that some wounded soldier might have a chance to live.

Today, now that the killing and the wounding of war has ceased, there is a shortage of human blood needed for the serious casualties and accidents of peacetime—and to continue to help wounded veterans in their long-continued fight toward health.

Doctors are worried over the shortage that the public does not know about—a shortage that should be easier to do something about than the shortages of meat, nylon, fats, clothes, houses and cars.

There have been reconversion difficulties in the supplying of the vital red fluid that can save a life. During the war it was on a national scale. Now it is a matter to be handled locally to a large extent, with each community on its own.

### Low Blood Deposits

And the deposits in the blood "banks" in most hospitals and community health centers are dangerously low—not because people are callous or unwilling, but because they do not realize that "working capital" is just as necessary to a blood bank as money on deposit to a financial bank.

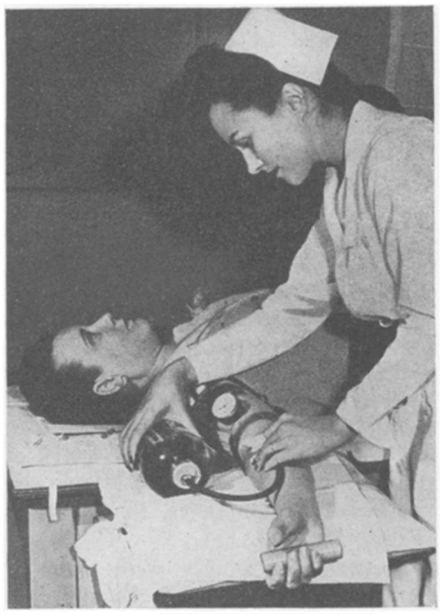
If you had walked into the community blood bank of the Nation's Capital a few weeks ago, you would have seen a single solitary bottle of whole blood on deposit there in its refrigerator. There should have been 20 bottles of various types, which any banker would agree would not be an excessive working capital even if each bottle were worth a thousand times more than the $40 or so that is the cost of a bottle of human blood.

If a score or two of the champion blood donors of the war days volunteered for peacetime service, a blood banking system for each locality in the nation could be "financed" and accident crises that are likely to come to any area would be sure to be met.

The peace needs for blood are somewhat different from war's demands. Whole blood, not plasma, is needed now. And the quantities are far smaller.

There is not a shortage of plasma, the fluid part of the blood. At the end of the war, the Red Cross had more than a million bottles of this material. This surplus plasma was made available to the public through health departments or approved medical organizations or institutions. Blood banks, even when running low on whole blood, are likely to have plasma on hand. This is because after the whole blood has become too old to use, the plasma can be drawn off and kept, either in liquid form, or frozen and dried.

Plasma is an extremely valuable material for treating certain conditions, such as shock from severe burns or wounds.



*VOLUNTEER—A few have not forgotten that the Red Cross is still collecting vitally needed blood. Blood banks for civilians are running dangerously low.*

When large amounts of blood are lost, however, nothing takes the place of whole blood. That is why, toward the end of the war, the Red Cross began supplying the Army and Navy with whole blood as well as with blood plasma and albumin. This would have been done earlier if a method had been discovered sooner for keeping the whole blood fresh from the time it was collected until it could be flown to Army and Navy surgeons treating the wounded overseas.

### Hemoglobin Important

Whole blood is red. Its color comes from the chemical hemoglobin, which transports oxygen to all parts of the body. When oxygen is lacking, death follows. Breathing air containing oxygen into the lungs is not enough. The oxygen must get from the lungs to all parts of the body. It does this via the hemoglobin in the red cells of whole blood.

When a healthy person loses the hemoglobin and red cells contained in one pint of blood, he can quickly rebuild more red cells and hemoglobin from food. Within eight weeks or less the deficit is made up. A severely wounded or injured person who has lost more than a pint of blood cannot do this fast enough. He needs fresh supplies of whole blood to tide him over until his body can start rebuilding plentiful supplies of hemoglobin and red cells on its own.

### Lack of Blood

Supplies of whole blood for patients dying of hemorrhage were obtained until shortly before the war from donors called on when the emergency arose.

No one knows how many men, women and children died because a donor could not be found in time. Devoted relatives and friends would answer the call to give a pint of blood, only to find to their grief that their blood was useless. It did not belong to the same group as the patient's blood. Injecting it into the patient's veins would kill him instead of saving him.

To meet these calamities, hospitals kept and still list professional donors. These were men, and occasionally women, in the community whose blood had been grouped and tested for absence of disease germs. When a patient with group A blood needed blood, group A

donors on the list were called. This often involved fatal delays.

### Blood Typed

First, the patient's blood must be typed. Then the donor list consulted. Then the phone calls made. One, two, three or maybe all of the donors of the right blood group may be out. When one is reached, he may just have finished dinner, or a bed-time or party snack. If this is the case, he cannot give blood because if he has eaten within the past five hours, his blood may contain substances that would harm the patient. When a suitable donor is finally located, there is further delay while he gets to the hospital.

This procedure may take two or three hours. If the blood is needed in the middle of the night, as so often happens in cases of automobile accidents, or homicidal or suicidal attempts, delay in getting a donor may be even greater.

Contrast that with the following report from a large eastern hospital:

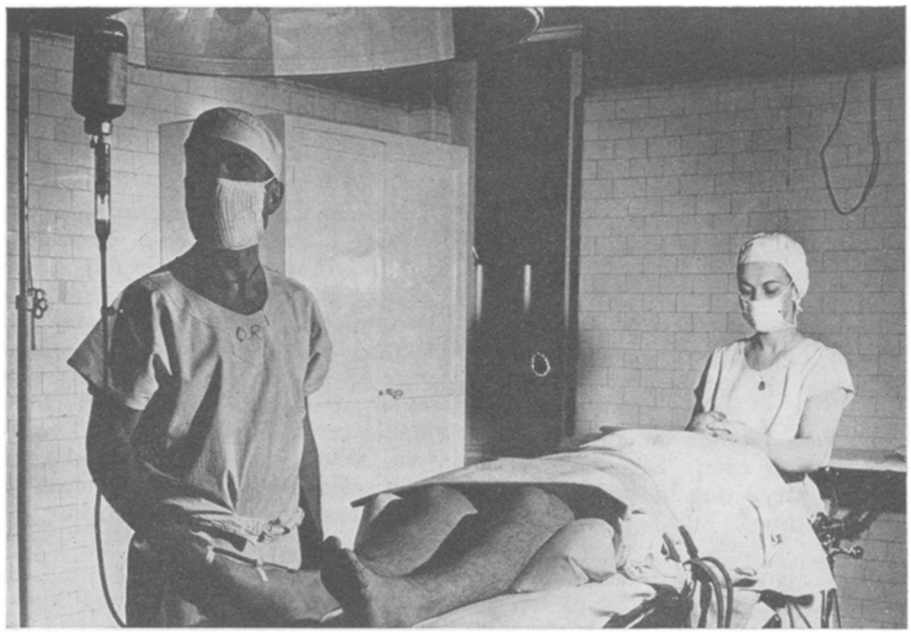
At 1:30 a.m. a 17-year-old expectant mother arrived at the accident room after a 35-mile trip by ambulance. She had a deathly pallor, her pulse could scarcely be detected. Death seemed a matter of minutes.

No time was lost in waiting for results of the test to show what her blood group was, or to type the blood of the young husband who had come with her. A bottle of group O blood, called "universal donor" blood because it is usually safe for persons of all groups, was swiftly brought from the hospital blood bank.

### Immediate Transfusion

At 1:40, within 10 minutes of her arrival, she was given a transfusion. With the blood still running into her veins, she was taken to the operating room. There, without interruption, she was given two more pints of blood while the surgeon was operating. By that time her blood had been typed. It was group A and the hospital bank had plenty of A blood on deposit. The following morning, because her blood was still very low in hemoglobin, she was given another pint of group A blood from the bank.

The most heroic efforts, under the old conditions, could not have provided this quantity of blood soon enough. Fortunately for this young girl, the hospital's blood bank was not bankrupt. It takes many donors, volunteer or paid, to keep blood banks solvent.



***BLOOD NEEDED—Blood for transfusions is needed for many of the 90,000 wounded still in Army hospitals such as this man at Walter Reed hospital.***

### Source of Donors

Relatives and friends of patients who get transfusions are one possible source of blood supplies for the banks. At the hospital where this patient had her transfusions, her hospital bill may have had a charge for four pints of blood—to be paid in blood. At this particular hospital, no patient, private or ward, can buy blood from the bank for cash. They may pay a professional donor for blood for the bank, or they have relatives and friends come in to give blood.

At some hospitals, there is a charge of $40 for each pint of blood from the bank. If the patient protests he cannot pay this charge, he is told that for each pint of blood repaid to the bank, $10 will be taken off his bill. Hospitals may themselves buy blood from professional donors and store it in their banks, charging the patients as the blood is withdrawn. This makes the blood costly. The hospital usually pays $25 a pint to its professional donors.

In addition, there may be a $10 charge to the patient to cover the typing and testing of the blood. In a good many hospitals there is also a $5 or $10 charge for what is called the "transfusion set." This includes the apparatus and the services of the intern who watches the patient afterwards, going in every hour or so to check on a possible bad reaction to the transfusion.

Some cities have community blood banks for all hospitals to draw on. Ideally, the hospital would send to the bank a relative or friend of the patient's to give a bottle of blood for each bottle withdrawn. In practice, this does not work out. Once the emergency is over, doctors, friends and relatives seem to lose their enthusiasm. So the bank is obliged to charge for the blood. The price is $25 per bottle.

### Refund for Blood

If a patient's relative does give a pint of blood to the bank, the patient is refunded $15. If a second pint is given, the bank refunds $10. This bank is a non-profit organization and gives blood free to those unable to pay, if the doctor in charge signs a statement that he has not charged a fee.

A Transfusion Credit slip is issued to anyone who donates blood for himself. In that way, a man can build up a balance in the blood bank, to be drawn on in case of need by himself, a relative or a friend.

Denver, Miami, New York City, Washington and Cincinnati have community blood banks. In Seattle, a prominent philanthropist raised $250,000 among a few citizens to start a community bank, then launched a community campaign for funds for maintenance and future upkeep.

Scientific research during two wars made possible blood banks and new uses of human blood to fight death and disease. In World War I, Dr. E. H. Robertson of the U. S. Army set up

# Do You Know?

Most *scientists* are for open research openly published.

Wrought iron *beams* were used to reinforce many of the Greek temples built 2,500 years ago, it is said.

Approximately 90% of the *fires* that destroy millions of American property each year are preventable.

*Calcium chloride* on a gravel road, one engineer states, "Keeps the road together, keeps dust down, and keeps people satisfied.

Four *chemical plants* are to be constructed in Egypt at a cost of approximately $8,000,000 to produce chemicals for the Middle East; an order for the plants has been placed in America.

Certain papers in which a special *resin* is included as an ingredient are strong even when wet and are particularly suitable for wrapping meats and other foods in food lockers.

*Sulfuric acid* has been produced for over 1,000 years, it is said; this basic chemical, which plays an important role in American industries, is now made in the United States in an amount approximating 10,000,000 tons each year.



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blood banks to help the wounded. Blood was donated by healthy or recovered soldiers at the rear, dextrose was added to preserve it, and it was kept in refrigerators until it could be sent up to the front.

Midway between the two wars, the Russian scientist, Dr. S. S. Yudin, began experimenting with freshly drawn cadaver blood which he preserved for transfusions. Results were good and thousands of transfusions of this kind were given. The blood has to be drawn within six hours after death from healthy persons who die suddenly. American doctors realized there would not be a sufficient supply of such blood in this country to meet the demand.

### First Blood Bank

The idea of obtaining blood donations from friends and relatives of patients and storing it for future transfusions was developed by the late Dr. Bernard Fantus at Cook County Hospital in Chicago. The first living donor blood bank in the world was established at this hospital in 1937.

A brief three years later came news of still another advance in blood transfusions. This was the development of methods for drying plasma, the liquid part of the blood, so that it could be kept safely for months and years, instead of a week or 10 days, and could be transported easily, compared to the difficulties of transporting whole blood.

Millions of bottles of dried plasma, from blood donated to the Red Cross, were shipped overseas for the war wounded. This vital stuff, however, still took considerable space, and shipping space was at a premium during the war.

From scientific laboratories again came a solution to the problem in the form of blood albumin, a more concentrated and therefore space-saving fraction of the blood. Pioneer of this development was Dr. Edward J. Cohn of Harvard.

Valuable by-products of blood were also obtained in Dr. Cohn's fractionation process that gave albumin for our war wounded. Among these are a globulin for protection against measles and substances to check bleeding during delicate surgical operations.

Newest type of blood bank is the one developed at Paterson, N. J. Mothers and babies threatened with death because of a difference between the mothers' and fathers' blood will be saved through this kind of blood bank. Actually it is more a club than a bank. Members are all persons having Rh negative blood.

Rh negative blood is relatively rare. It is often difficult to get the small amount needed for typing the blood of the mother, much less enough for transfusions for baby and mother. When they can get enough of the necessary blood serum, blood banks type their blood for this factor, as well as for the blood groups.

Mothers and babies, civilian victims of accidents, patients facing major surgical operations, many of the 90,000 war wounded still in Army hospitals throughout the world need blood. At the 22 Army general hospitals in the United States treatments requiring whole blood continue around the clock, Major-General Norman T. Kirk, Surgeon General of the Army, reports.

Scientists have made it possible to help all these if the public will help keep the blood banks out of bankruptcy.

*Science News Letter, November 9, 1946*

INVENTION

## Device Saves Fuel to Warm Passenger Space of Planes

➤ THE LATE Henry J. DeN. McCollum of Chicago must have done what many other airplane passengers do: watched the red-hot exhaust pipe and worried a bit about the waste of costly fuel it represented. Unlike the rest of us, he undertook to do something about it, and U. S. patent 2,408,867 covers his system for warming the passenger space and de-icing the wings with radiant heat from this source.

Basically, the idea is very simple. It consists in putting alongside the exhaust pipe a long reflected or parabolic cross-section, its focus directed towards an infra-red-transmitting glass window in the side of the fuselage. Back of this window, the heat rays strike a black-painted duct which is part of the plane's air-circulating system. Shutters facilitate control.

The radiant de-icing system is also simple. A source of radiant heat near the root of the wing directs its beam towards the tip. The internal wing struts are perforated to let the rays pass through. At intervals, angled reflectors, also perforated in a carefully worked-out pattern, direct the heat against the inside of the leading edge.

*Science News Letter, November 9, 1946*