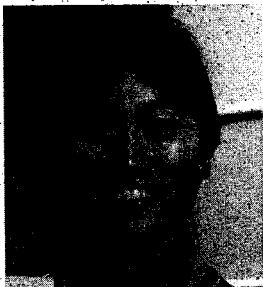




Risk in Perspective

Patients' Willingness to Pay for Autologous Blood Donation

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"Would you choose to have your blood donated and stored before your operation if the total charge that you would have to pay out of your own income was \$1,000?"

Imagine that you are scheduled for elective surgery. On average, eight percent of patients having this operation receive a blood transfusion. You live in California, and as is required by law, your surgeon explains that autologous blood donation (ABD) [donating and storing your blood prior to surgery] is an option. If you need a transfusion, your own banked blood would be used first. If you are not able to donate blood, decide not to participate in ABD, or require more blood than you have banked, allogeneic blood from the volunteer blood supply will be used. Your surgeon informs you that this allogeneic blood is screened for all known infectious agents and is thought to be very safe.

What would you do? Would you donate blood for yourself or not? If ABD were not covered under your insurance

policy and you had to pay out of pocket for the procedure, how much would you be willing to pay? In this issue of RISK IN PERSPECTIVE, we discuss policy issues surrounding ABD and the use of contingent valuation as a method to measure patients' willingness to pay (WTP) for this procedure.

ABD IS NOT COST-EFFECTIVE

Why are people so concerned about ABD, which accounts for a very small part of the total surgical and hospitalization costs? Several articles have now been published concluding that ABD is not cost-effective. Although a unit of autologous blood costs \$76-\$198 (about \$21-\$48 more than a unit of allogeneic

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blood), the very low health benefit, about 0.0003 quality-adjusted life years or 2.6 quality-adjusted life hours per transfusion, brings the cost-effectiveness ratio (\$235,000 to \$23,000,000 per quality-adjusted life year) into a range considered cost-ineffective. We argue that with some procedures like ABD, sometimes "intangible" values such as peace of mind can be very important, that these benefits are not captured in traditional cost-effectiveness analysis, and that it may be possible to quantify such values through contingent valuation.

Receiving allogeneic (or volunteer) blood used to be much more dangerous than it is now. Before awareness of the human immunodeficiency virus (HIV), and before better screening of donors and blood products, the risks of hepatitis B and C and HIV were much higher than they are today. The discovery in 1984 that HIV was transmissible in blood products helped fuel public aversion to transfusions.

In the climate of extreme fear about HIV, several health organizations including the American College of Physicians and the American Medical Association issued statements attesting that autologous blood was the safest type of blood product and should be used when possible. The state of California passed the Paul Gann Blood Safety act requiring physicians to discuss autologous blood donation with patients prior to elective surgeries.

However, the appropriate use of ABD is being reevaluated. Allogeneic blood products are safer than ever, and there is greater recognition of the negative consequences of autologous blood donation (i.e., the possibility of ex vivo bacterial infection, blood bank error resulting in erroneous transfusion of units, and potential negative health consequences from the donation process itself or resulting anemia). While recognizing that autologous blood is still the safest from an infectious standpoint, organizations are now urging a 10% or greater likelihood of requiring a transfusion before recommending that patients participate in ABD in order to balance these risks.

I PREFER MY OWN BLOOD

We sought to measure patients' preferences for autologous blood. In two studies, we used contingent valuation methods (so called because responses are "contingent" upon the scenario presented) to measure the preferences of autologous blood donors. This methodology was developed in the environmental field to assess the value of "intangible" goods such as cleaner air and improved water quality. Respondents are presented with hypothetical scenarios and asked whether they would purchase the "intangible" good at a specified price. By varying the price in different subgroups, a demand curve for the "intangible" good can be estimated. The area

under this curve is the mean WTP and the median WTP is the price at which 50% of the sample would agree to pay the proposed price. In presenting the good as a market choice, respondents are encouraged to weigh perceived costs and benefits just as they do when making consumer choices.

In the first study, we studied 235 autologous blood donors and asked: "Insurance currently pays for most costs of ABD. In the future, the hospital may charge patients who want to donate their own blood. Would you choose to have your blood donated and stored before your operation if the total charge that you would have to pay out of your own income was \$X?" (X was randomized to a value between \$10 and \$10,000)

We found a median population willingness to pay of approximately \$1,250. In multivariable regression, higher willingness to pay was associated with greater dread of allogeneic transfusion, greater perceived likelihood of requiring a transfusion, and income. How should these results be interpreted? The validity of contingent valuation is supported by the association of willingness to pay with factors expected to affect a patient's decision making, such as fear of the alternative (allogeneic blood), perceived risk of requiring a transfusion, and income. In spite of this, it is important to interpret the absolute willingness to pay figures cautiously, since they are based on hypothetical questions.

We subsequently conducted a separate study of 412 patients to determine whether provision of accurate risk information affected willingness to pay. We randomized patients to either receive risk information or not. Recipients of probabilistic risk information regarding allogeneic transfusions were willing to pay less than patients who were not informed about the risks (\$1100 vs. \$1900). However, both groups were still willing to pay much more than the actual cost of ABD.

So what can one conclude from these studies? First, contingent valuation methods do seem to be measuring previously "intangible" benefits such as peace of mind. These values must somehow be placed in the context of other economic costs and medical benefits. Second, our patient population highly values access to autologous blood donation even after receiving information about the actual risks of allogeneic blood. What is an acceptable level of risk? To some, the 1/60,000 risk of hepatitis B, 1/100,000 risk of hepatitis C and the 1/500,000 risk of HIV are not acceptable if a procedure exists to minimize these risks. On the other hand, few people stop driving cars although the annual risk of dying in an automobile accident is 1/6,000 in Massachusetts.

DREAD AND REGRET

Dr. Paul Slovic's theories of risk may help explain the willingness to pay for ABD. He points out that there are two types of risk that particularly

FURTHER READING:
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PEER REVIEWERS:
 Peter Neumann, Sc.D.
 Bengt Liljas, Ph.D.
 Magnus Johannesson, Ph.D.

trouble people. First are the "dread" risks. These risks have terrible or perhaps fatal consequences and are characterized by lack of controllability. Acquisition of HIV by blood transfusion is a good example. Second are the "unknown risks" where the outcome is delayed or unfamiliar. For example, although the volunteer blood pool is very carefully screened for known risks, this does not mean that new blood-borne contagions will not be discovered in the years to come.

Dr. David Bell's regret theory may also play a role in the strong preference for ABD. Patients scheduled for elective surgery may fear a lack of control. If they can donate autologous blood, it will be "in the bank" for them should they need it. If they elect not to bank their own blood, they run the risk of regretting that decision should a postoperative transfusion be necessary.

CONCLUSION

The number of ABD procedures is no longer increasing in this country despite continued public surveys documenting strong preferences for autologous blood. Perhaps this leveling off means that ABD has reached an equilibrium of appropriate use. It is not clear whether knowledge of the cost-effectiveness ratio has had an effect upon the utilization of ABD.

So, what would you want to do if you were going to have an elective surgery and your risk of transfusion were 8%? According to current recommendations, you should not be encouraged to participate in ABD. If you feel differently, how much would you be willing to pay for that privilege, and should your preferences be weighed equally, more, or less than other economic and medical considerations?

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