L 1**THE FUTURE OF RESEARCH IN TRANSFUSION MEDICINE;
CAN WE MAKE BLOOD TRANSFUSION SAFER AND MORE EFFECTIVE ?**

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Our ability to meet patient needs falls short of our expectations in some instances. Fortunately, recent scientific developments suggest ways in which these problems can be addressed. This lecture will address how research can improve the safety of blood and blood-related products; how the effectiveness of this therapy can be improved; and how an adequate supply can be assured.

While there are now good methods to sterilize plasma derivatives, much more work is needed to assure comparable freedom from infectious diseases transmission by whole plasma, red cells, and platelet concentrates. Plasma treated with the solvent-detergent technique is expected to be a significantly safer product, but the treatment of cellular blood products remains a difficult problem for which there are no immediate solutions. We need to better understand the interaction of viruses and bacteria with red cells and platelets if there is to be progress in addressing this concern.

A second important safety concern is the problem of immunosuppression produced by some blood products. It needs to be determined if leukocyte reduction in red cell products can prevent this problem.

The effectiveness of some transfused blood products is now limited by the development of alloimmune reactions. This can be a serious condition, especially for platelet transfusion. A better understanding of alloimmunization and the identification of ways to prevent this problem will markedly improve the practice of Transfusion Medicine. We also need to develop improved blood product storage conditions and to develop new blood products.

Fortunately, progress in biomedical research is providing the necessary tools to address these needs. It is entirely possible that conditions will be identified that support the production of cellular blood products in tissue culture. In addition, recombinant technology may permit production of essential proteins for therapy even though they are difficult to prepare from plasma because of low concentration or instability. Scientists also hope to develop modified "second generation" products that avoid limitations inherent in some natural proteins. Finally, recombinant growth factors have already had an important effect in Transfusion Medicine, and additional products are anticipated.