Introduction

The health care policies of this decade have been dominated by concerns by both patients and providers regarding the quality and access to treatment and its associated cost. The patient's quality of life has become a strong consideration when designing individual patterns of care. When specific criteria are met, home health care can be a convenient, beneficial, and cost-effective alternative to hospitalization for many patients.

Home health care has several advantages (Table 1), and these same benefits can be applied to support the practice of administering blood transfusions in the home. Inpatient hospitalization is expensive, and the demand for out-of-hospital services is partially fueled by efforts to contain costs. Patients who are frail, chronically ill, or terminally ill may be considerably more comfortable, both physically and psychologically, when receiving home care. In an age of consumer awareness, growing numbers of patients are demanding these new services. A rapidly expanding population of home-bound patients, elderly individuals, patients infected with the human immunodeficiency virus, and others may benefit from home health care. With current sophisticated venous access devices, routine hospital services can be more easily provided in the home. A precedent for sophisticated home health care services already exists -- ventilatory support, parenteral nutrition, intravenous antibiotics, chemotherapy, and pain medication are now routinely provided in the home.

Implementing a Home Care Program

In recognition of the increasing demand for home health care, the number of home health care agencies in the United States increased by 70% from 1989 through 1995. Out-of-hospital health care can be provided in a number of settings, including an outpatient hospital clinic or surgical center, physician's office, ambulatory care center, dialysis center, or the patient's home.

The home setting causes the most concern, particularly in reference to blood transfusions, because of the limited complex care that could be provided if a severe, adverse reaction occurred. A home transfusion program should have adequate safeguards to ensure that patient safety is not jeopardized.

Approval for establishing a home transfusion program should be obtained from the hospital's medical staff, transfusion committee, transfusion service, administration, and legal counsel. Most programs rely on the hospital or blood center to provide the necessary blood bank testing (eg, ABO and Rh typing, red blood cell antibody screening, and crossmatching). The blood is then transported and transfused by qualified personnel from either the hospital or the home health care agency. The physician’s order should stipulate not only the component type and number of units, but also the flow rate, concurrent fluids to be administered, any necessary premedications, and laboratory tests to be obtained before and after transfusion.

Eligibility Requirements

Most home transfusion programs agree on a number of criteria that must be met prior to initiating transfusions in a patient's home: Patients who are eligible for home transfusions are often debilitated, chronically ill individuals who may require more frequent transfusions over longer periods of time than many hospitalized patients who require transfusions. An appropriate candidate should meet home-bound constraints that make transportation to the hospital difficult. The patient should be cooperative, have a stable cardiopulmonary status, and have acceptable venous access. The patient should have been recently evaluated by his or her physician. The first blood transfusion should not be in the home due to the risk, though rare, of an anaphylactic reaction in a patient with IgA deficiency. A history of moderate to severe transfusion reactions should disqualify a patient. The transfusion risk:benefit ratio itself, as well as the added stress placed on these patients and their families for in-hospital transfusions, should be considered when deciding if a patient should receive a transfusion in the home setting.

Home transfusion recipients are generally anemic and/or thrombocytopenic patients with diagnoses such as end-stage malignancies, acquired immunodeficiency syndrome, chronic gastrointestinal bleeding, or anemia of chronic disease. The most common components transfused in the home are red blood cells and platelets. Plasma components -- fresh frozen plasma and cryoprecipitate -- are rarely transfused in the home.

Since advanced emergency medical care should be available within a reasonable time period, patients living in rural areas are generally not appropriate candidates. A second responsible adult should be present to assist the transfusionist. If a telephone is not available in the home, the transfusionist should have access to a cellular phone. In order to maximize patient safety, the service should be offered during the daytime only; evenings, weekends, and rush-hour periods should be avoided.

Guidelines of a Home Care Program

Table 1. — Advantages of Home Health Care

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<th>Cost are controlled</th>
<th>Physical and psychological comfort of the patient is improved</th>
<th>Patient demand is fulfilled</th>
<th>More seriously ill patients are served</th>
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Kaaron Benson, MD, Pathology Service, H. Lee Moffitt Cancer Center & Research Institute
Policies and procedures detailing all aspects of the program need to be developed. Several sources provide detailed steps to follow and sample forms. The American Association of Blood Banks' Standards for Blood Banks and Transfusion Services provides guidelines for safe transfusion practice. Topics that should be addressed in the policies and procedures of a home transfusion program are listed in Table 2. Patients should be approved for home transfusions by both the attending physician and the blood bank director. Proper patient identification and linkage of the blood bank samples to the units of blood are critical. The application of a patient identification band at the time of sample collection is recommended. Appropriate blood bank tests include patient ABO/Rh typing for red cell and platelet transfusion, as well as an additional red cell antibody screen and crossmatch for red cell transfusion. Details regarding blood administration should indicate acceptable flow rates (typical rates for red cell units are 1.5 to 2.0 hours per unit; platelets are administered as quickly as the patient can tolerate), concurrent intravenous fluid administration, and required monitoring of the patient during and after the transfusion.

The components considered appropriate for home transfusion should be determined in advance. There should be no need for whole blood or granulocytes, and plasma components (fresh frozen plasma and cryoprecipitate) should be only rarely indicated for home transfusion. Stipulating the maximum number of units that may be routinely administered in the home may be effective in avoiding volume overload. Some programs recommend the use of diuretics during or after transfusion for patients at risk for volume overload, and some routinely use filtered cellular components to minimize the risk of febrile nonhemolytic reactions. Premedication for transfusion should be reserved only for patients with prior reactions, but the transfusionist should be equipped with certain medications (eg, acetaminophen, diphenhydramine, epinephrine) in the event of a reaction. Universal precautions must be applied, and all materials with blood or body fluids must be removed from the home and properly discarded.

Minimum qualifications of the transfusionist must be determined. Many programs require experience with prior transfusions and/or acute care. Certification for transfusion administration is required by some states. Methods to evaluate training and competency must be established as part of a complete quality assurance program.

Obtaining a patient's informed consent for blood transfusion is mandatory, but many hospitals do not use a standardized form. Hospitals may choose to obtain consent verbally without requiring the patient to sign an informed consent form. When transfusions occur outside the hospital, a standardized consent form is recommended that describes the procedure, anticipated benefits and, most importantly, the additional risks incurred by being at a distance from acute medical care.

### Benefits, Risks, and Disadvantages

While home transfusion provides several benefits, a significant risk is the decrease in patient safety when access to advanced medical care is compromised due to location. This risk may be lessened by the enhanced supervision of the patient by the transfusionist who is responsible for only one patient. Still, if acute hemolysis, endotoxic shock, or anaphylaxis occurs, the patient must be managed by one individual with limited resources until emergency personnel arrive. Thus, potential transfusion recipients must be carefully selected based on eligibility criteria and not solely on convenience for the patient.

Transfusion recipients have also expressed concerns about patient safety. In one study of 29 oncology patients who received chronic transfusions in a hospital outpatient clinic, 93% did not want home transfusions, and 72% believed that home transfusions posed a greater risk than transfusions in the hospital.

Evaluations of home transfusion safety are limited; however, these transfusions are generally reported to be safe when appropriate procedures and precaution are used. Thompson and Miller reported administering 1,096 red cell and platelet units to 321 patients over four years without adverse consequences. Pluth and Miller administered a total of more than 700 components in the home without complications. At our center, we have provided blood transfusions in the home since 1991. While the numbers have been relatively small (approximately 100 red cells and 150 platelets transfused annually), no moderate or severe reactions have occurred (K.B., unpublished data, 1997).

Home health care is generally touted as less expensive than hospital-based care. However, while administration of intravenous antibiotics and care of ventilator-dependent adults can be provided at a lower cost in the home, blood transfusions may not be cost effective in the home setting. Some preliminary evidence indicates that home care may not always produce savings compared with hospital or nursing home care. Red cell transfusions are generally administered over one to two hours and up to four hours per unit transfused.

The typical two-unit transfusion requires that the transfusionist remain with the recipient in the home for an average of two to four hours and up to eight hours. An additional hour may be needed to prepare for the transfusion and to monitor the patient at the completion of the infusion. The transfusionist also may need to pick up the units at the transfusion service and deliver them to the patient's home, after the sample for blood bank testing has been previously collected, delivered to the transfusion service, and tested. In the hospital setting, the units are readily available for transfusion, and the transfusionist can attend other patients during the infusion. In a comparison of charges for blood transfusions in the home and hospital for the Tampa, Florida region, no significant differences were seen between the two settings. However, patients and their families may realize savings by not having to transport the patient, pay for meals away from home, and incur lost income of family members who would otherwise accompany the patient.

### Conclusions

Home transfusion therapy is a relatively new service. Many hospitals, blood centers, and home health care agencies are carefully assessing their existing practices. The American Association of Blood Banks has recently surveyed facilities with home transfusion programs to determine current practice. Physicians and hospitals interested in establishing a home transfusion program need to determine who will be responsible for blood bank testing, preparing the blood component, and infusing the blood. A clear understanding must exist among the ordering physician, hospital administration, transfusion service, blood center, and home health care agency.
Out-of-hospital medical services have expanded with increasingly sophisticated care provided in the patient's home. While the benefits and risks of transfusions are well recognized, blood transfusions in the home incur additional risk due to the distance from emergency medical services. Careful assessment and use of appropriate policies and procedures involving a home transfusion program can minimize the additional risks of home transfusion. The patient's physician, the hospital's transfusion service and transfusion committee, the local blood center, and the home health care agency may all have responsibilities for providing a safe transfusion in the home. By establishing a quality home transfusion program, optimal medical care can be provided to patients for whom the burden of inpatient transfusion would present a hardship.

References