649 GRANULOCYTE YIELDS IN LEUKAPHERESES WITHOUT STEROIDS AND HYDROXYETHYL STARCH (HES). Edward C. Russell, Carolyn E. Thomas, Nancy B. McWilliams, and Harold M. Maurer. Medical College of Virginia, Departments of Pediatrics and Pathology, Richmond, Virginia.

16 febrile, neutropenic patients, 3 - 77 years of age, received a total of 49 granulocyte transfusions (mean = 3.06/pt.) between May and December 1976. Granulocytes were used in addition to antibiotics for treatment of sepsis, either suspected or proved. Granulocytes were collected by semi-continuous centrifugation utilizing the Haemonetics Model 30 Blood Processor with ACD as the anticoagulant. Corticosteroids and HES, a rouleaux-producing agent reported to improve the separation and collection of granulocytes, were not used in the leukapheresis. The mean volume of blood processed/transfusion was 2.92 liters (± 0.50) with a mean total WBC yield of 2.13×10^9/liter blood processed (LBP), ($\pm 0.58 \times 10^9$). The mean yield of granulocytes/LBP was 0.63×10^9 ($\pm 0.36 \times 10^9$). This granulocyte yield was markedly below values reported using HES and steroids in this system (3.5×10^9/LBP). The granulocyte yield we obtained was actually less than that obtained from simple phlebotomy of 500 ml of fresh whole blood (mean 1.67×10^9/500 ml $\pm 0.38 \times 10^9$). A good clinical response was achieved in only 5/16 patients (31%), and this was below the expected rate of response of at least 60%.

We conclude that the yield of granulocytes collected without steroids and HES is inadequate and emphasize the necessity for continually monitoring granulocyte yields in leukapheresis.

650 PROGNOSTIC FACTORS IN CHILDHOOD ACUTE LYMPHOBLASTIC LEUKEMIA (ALL). Stephen Sallan, Bruce Camitta, Leonard Chess, and David Nathan. Sidney Farber Cancer Institute, Children's Hospital Medical Center, Boston.

Classic adverse prognostic factors in childhood ALL include age <2 >9 years, elevated white blood count (WBC) and the presence of an anterior mediastinal mass (AMM). Sub-populations of ALL based upon immunologic surface markers suggest that T-cell leukemia is also an adverse factor. Using a recently described chemotherapy protocol (Med. & Ped. Oncol 2:157, 1976), we treated 69 children subclassified by newly described immunologic markers. T-cell disease, demonstrated by a human anti-thymocyte antibody, was found in 10/69, and another marker p23,30 (a neodifferentiation antigen isolated from a human lymphoblastoid B-cell line) found in 54/69. Five of 69 were positive or negative for both markers. With a median follow-up of 21 months, disease-free survival for the $p23,30^+$ group was 85% by life-table analysis at 36 months, whereas the median time to relapse for the T^+ group was 15 months. On the contrary, age and WBC were not statistically significantly different from the total group. Those with AMM did poorly, but all were also T^+ patients. We conclude that childhood ALL represents a heterogenous group of diseases, and that major prognostic discriminents must be re-evaluated in planning future treatment programs.

651 THE USE OF PARTIAL EXCHANGE TRANSFUSION (ETX) IN CHILDREN WITH SERIOUS COMPLICATIONS OF SICKLE CELL ANEMIA (SS). Ashok Shende, Gungor Karayalcin, Philip Lanzkowsky. Sch. of Med., Health Sciences Ctr., State Univ. of N.Y. at Stony Brook and Long Island Jewish-Hillside Med. Ctr., Dept. of Pediatrics, New Hyde Park, New York.

Six children from 2 to 13 years of age with SS were treated with ETX for the following serious complications: pneumococcal sepsis and meningitis, hepatic crisis, severe hepatic dysfunction before cholecystectomy, SS lung syndrome, SS lung syndrome and congestive heart failure and refractory painful crisis. Hemoglobin S ranged from 64.6 to 100% with a mean of 86.7% pre-ETX compared to 21 to 33% with a mean of 27.6% post-exchange. Relief of symptoms and improvement in the functions of affected organs were observed in all patients following ETX. In the hepatic crisis the total bilirubin level of 28.5 mg/dl (15.0 mg/dl direct) prior to ETX decreased to 6.9 mg/dl (2.4 mg/dl direct). In the SS lung syndrome the PO_2 was 40 mm Hg prior to and 99 mm Hg after ETX. Technically the procedure of ETX is easy. ETX effectively removes irreversibly sickled cells, reduces the viscosity of blood and improves the micro-circulation without volume overload which would be the case in simple transfusion. For these reasons ETX merits use in potentially fatal or chronically debilitating complications or in the preparation for surgery in selected cases of SS.

652 UTILIZATION OF A SCORE SYSTEM IN THE PROGNOSIS OF ACUTE LYMPHOCYTIC LEUKEMIA (ALL) IN CHILDHOOD. Ashok Shende, Philip Lanzkowsky, Vincent Fisichelli. Sch. of Med., Health Sciences Ctr., State Univ. of N.Y. at Stony Brook and Long Island Jewish-Hillside Med. Ctr., Dept. of Pediatrics, New Hyde Park, New York.

The purpose of this study was to develop a scoring system which would assist in the prognosis of ALL in childhood. The following system was utilized retrospectively on the initial clinical data on 41 children with ALL who received systemic combination chemotherapy and central nervous system (CNS) therapy ± organ (liver, kidneys and spleen) irradiation.

Age (yr)		Thymic Mass	Liver (cm)	Spleen (cm)	Hgb gm/dl	Platelet/ cub mm	CNS Leukemia
3-6	<2 or >10		>5	>5	>11.0	$>10^5$	
-1	+1	+1	+1	+1	+1	-1	+1

Numerical values yielded total scores ranging from -2 to +3 for each of 41 patients. Mean scores for those who succeeded (i.e. continuous remission of at least 2½ years) was significantly different at the 0.005 level compared to those who failed (i.e. relapse or death). The implication of this is that such a scoring system (not incorporating the WBC) when used in conjunction with the white cell count may more accurately determine the prognosis of ALL in childhood.

653 CLINICAL ASPECTS OF AUTOIMMUNE HEMOLYTIC ANEMIA IN CHILDREN (AIHA). Ashok Shende, Philip Lanzkowsky, Tony Hsu. Sch. of Med., Health Sciences Ctr., State Univ. of N.Y. at Stony Brook and Long Island Jewish-Hillside Med. Ctr., Dept. of Pediatrics, New Hyde Park, New York.

Fourteen patients with AIHA between the ages of 10 weeks to 18 years were investigated. Of these 10 had warm reactive autoantibodies (6 anti-dl, 1 anti-nl, 1 anti-Rh_o, 1 non-specific, 1 Coombs negative IgG) antibody) and 4 had cold reactive autoantibodies (3 anti-I and 1 non-specific antibody). At the time of initial diagnosis the hemoglobin levels varied from 2.8 to 8.7 gm/dl. Four patients had reticulocytopenia at the onset. In 2 patients the haptoglobin levels were normal. One patient received no treatment, one only required a blood transfusion and 12 were treated with corticosteroids of which 11 responded successfully. The patient who failed to respond to corticosteroids also did not respond to exchange transfusion and immunosuppressive drugs but responded following splenectomy. Eleven were idiopathic and 3 had the following associated conditions: mycoplasma pneumonitis, systemic lupus erythematosus and a "panhematoimmunopathy" (anti-neutrophil autoantibody, anti-platelet autoantibody and anti-dl). In most of these patients the course of AIHA was transient, due to warm autoantibodies and responsive to steroids. Coombs negative AIHA is an uncommon entity requiring detailed immunohematologic investigations including the use of the autoanalyzer and elution studies for its identification.

654 L-ASPARAGINASE (L-ASP) INDUCED COAGULATION ABNORMALITIES. Richard Sills, Douglas Nelson, and James A. Stockman III, Dept. of Peds., SUNY, Syracuse, N.Y. (Spon. by Frank A. Oski).

Clotting abnormalities can occur with L-Asp therapy. During routine monitoring of coagulation studies in 7 consecutive patients with acute lymphocytic leukemia receiving L-Asp IV (1000 μ/Kg/da x 10 d) a prolonged PTT was noted in all. In order to determine the frequency of specific clotting abnormalities, 5 of these patients were studied more thoroughly. The PT was normal in all. The thrombin time was prolonged in 3/5 subjects. The fibrinogen level was abnormal in 4/5, but never fell to less than 100 mg%. Fibrin split products were not detected in any subject. Factors XII, XI, X, VII and V remained normal while F-VIII demonstrated occasional inconsistent abnormalities. In all patients, depressed levels of F-IX occurred with the minimum levels ranging from 11 to 19%. No F-IX inhibitors were found. The low F-IX levels remained low until the drug was discontinued, then promptly returned to normal in 4-7 days. In several patients, the drug was continued in spite of the clotting defect and clinical bleeding manifestations did not occur. Liver function tests were normal in all. The coagulation abnormalities were observed with 3 different lots of L-Asp. These findings indicate a pattern of coagulation abnormalities not previously noted: specifically that the most frequently occurring disturbance is depression of F-IX levels which was observed uniformly in all subjects studied prospectively.