constant pressure. Flow velocity (μl/sec) was calculated. Cell suspensions were modified by adjusting temperature, pH and pO2 prior to filtration. Mean corpuscular volume (MCV), reticulocyte count and fibrinogen were measured. Viscosity of whole blood, 40% cells in autologous plasma and 80% washed cells was determined.

Filterability, as a measure of RBC deformation, was markedly decreased in newborn samples. Mean flow velocity was 2.2 μl/sec $\pm$ .6 (S.D.) for newborns and 4.5 μl/sec $\pm$ .8 for adults ($p < .001$). Lowered pH or pO2 in the prefiltrate resulted in significantly decreased filterability in newborn samples only. Filterability correlated poorly with MCV. Two infants with polycythemic hyperviscosity syndrome showed increased viscosity of whole blood, 80% cell suspension and markedly decreased filterability. An infant with pyknocytosis showed decreased filterability and elevated viscosity of an 80% suspension compared to normal newborns.

Decreased deformability of the fetal RBC may be related to shortened newborn RBC survival involving diminished ability to pass through the splenic microcirculation. The decreased fetal RBC deformability which can be aggravated by acidosis and hypoxia contributes to hyperviscosity in newborns with high hematocrits. The decrease in red cell survival and anemia in infantile pyknocytosis may also be related to altered RBC deformability.

Prediction of severity of disease in homozygous β thalassemia (β thal). YUET W. KAN and DAVID G. NATHAN. *Children's Hosp. Med. Ctr. and Harvard Med. Sch., Boston, Mass.*

The clinical consequences of homozygous β thal are variable. We have studied globin chain synthesis in the peripheral blood reticulocytes of the parents of patients with homozygous β thal to determine the likelihood of mild and severe β thal in families in which both parents have thal trait. Peripheral blood was incubated with U ^{14}C leucine. The ratio of the specific activities of β and α chain separated by urea CMC chromatography (β/α ratio) was determined. The β/α ratios of 14 parents of patients with severe disease was compared to those of 10 parents of patients with mild disease. The mean β/α ratio in the former group of parents was 0.49 with a narrow standard deviation of 0.06. The mean ratio in the group of parents of patients with mild disease was 0.68 with a wider standard deviation of 0.21. Two patterns were observed in the milder group: (1) the ratio in one parent was close to 0.50, while the other parent had a significantly higher ratio (0.71 to 1.09), and (2) both parents had moderately elevated ratios (0.65). The higher ratios in the milder group may represent a milder β thal gene or the co-inheritance of an α thal gene, either one of which reduces the severity of homozygous β thal. We conclude that the study of peripheral blood globin chain synthesis in prospective parents with β thal trait may be extremely useful for estimating the potential severity of homozygous β thal in their offspring.

Phototherapy in ABO hemolytic disease of newborn. EUGENE KAPLAN, FRITZ HERZ, ELSIE SCHEYE, and LAWRENCE ROBINSON, JR. *Sinai Hosp. of Baltimore, Inc., Baltimore, Md.*

In hyperbilirubinemia of ABO hemolytic disease of newborn (ABO-HDN), phototherapy is less effective in lowering bilirubin concentrations than in hyperbilirubinemia of prematurity or nonhemolytic disorders of newborns. Nevertheless, phototherapy does alter patterns of serum bilirubin in ABO-HDN, as seen in a comparison of 29 treated infants with 144 untreated infants.

In ABO-HDN, recognizable patterns of serum bilirubin result from variations in the *severity of onset* in the 1st day of life, and in the time, extent, and duration of *maximum serum bilirubin* concentrations. A severe onset is seen in 1/3 of infants with ABO-HDN, serum bilirubin increasing at a rate of 0.5 mg/hr or greater. Peak bilirubin levels are noted on day 1 (10% of infants), day 2 (30%), day 3 (40%) and day 4 or 5 (20%). The peak bilirubin concentration is less than 16 mg% in 1/3 of the infants; between 16 and 19 mg% in 1/3 and exceeds 20 mg% in the remaining 1/3. In 1/3 of infants the maximum bilirubin concentration remains unchanged for at least 24 hrs. before decreasing.

On phototherapy, the bilirubin levels in 20% of infants with ABO-HDN continue to rise, remain unchanged in 40% and decrease in 40%. Light is least effective in infants with severe onset during the 1st day of life. However, in no infant on phototherapy does bilirubin reach its peak after the 3rd day of life and the maximum bilirubin concentration exceeds 20 mg% in only 10% of treated infants.

In-vitro chromosomal radiosensitivity in Fanconi's anemia. MAKOTO HIGURASHI and PATRICK E. CONEN (Intr. by Bernard Laski). *Univ. of Toronto and Hosp. for Sick Children, Toronto, Ont., Canada.*

Peripheral blood samples and fibroblast cultures from 5 children with Fanconi's anemia and 4 controls were irradiated with 10 and 100 rads; other controls were non-irradiated duplicate cultures. Blood cultures were harvested at 52 and 72 hours. Fibroblast cultures were irradiated 24 hours before fixation. Radiation break frequencies were calculated by subtracting figures for non-irradiated samples from those for irradiated samples. The number of chromosome-type breaks per cell per rad *in irradiated controls* was 0.0025 $\pm$ 0.0005 (52 hour cultures) and 0.0017 $\pm$ 0.005 (72 hour cultures) in lymphocytes, and 0.0059 $\pm$ 0.0016 in fibroblasts, and *in irradiated cells from Fanconi's anemia* was 0.0103 $\pm$ 0.0016 (52 hour cultures) and 0.0074 $\pm$ 0.0036 (72 hour cultures) in lymphocytes, and 0.0103 $\pm$ 0.0034 in fibroblasts. The number of dicentrics and rings per cell was significantly greater in the Fanconi's anemia samples than controls at 100 rads. We concluded that, in-vitro, chromosomes of cells from children with Fanconi's anemia were significantly more radiosensitive than those of controls ($P < 0.01$).

Microlymphocyte transformation (MLT) determinations of peripheral blood and marrow aspirates from children with acute lymphocytic leukemia. DAVID M. MUMFORD, JORDAN R. WILBUR, RACHID A. CHEEMA, CAROLYN A. BOUTTE, and DONNA L. RAUMAKER. *M. D. Anderson Hosp. and Tumor Institute, and Baylor Coll. of Med., Houston, Tex.* (Intr. by George W. Clayton).

Utilizing an 0.1 cc whole blood in vitro microlymphocyte transformation technique (MLT) previously described (Mumford, *Fed. Proc.* 29: 369, 1970), human peripheral blood white cells from acute lymphocytic leukemic (ALL) patients have been tested for immune responsiveness (triplicate runs) in 30 children during various stages and treatment of their disease. A mitogen (PHA) and selected common specific antigens were employed. Concurrent MLT runs (duplicate) on bone marrow aspirates taken at the same time were performed. While some MLT kinetics differ slightly from "macro" lymphocyte transformation studies (esp. optimum day of harvest), sensitivity approximates the "macro" test. Responses were considered positive when the ratio of positive stimulated cultures were greater than twice the control val-