INFLUENCE OF DEEP HYPOTHERMIA ON COAGULATION FACTORS IN CARDIAC SURGERY. Ch. Dautrempuich, A. Chauve, C. Oca, M. Boisseau and F. Fontan. Hôpital du Tondu, Bordeaux, France.

This study was conducted on a group of 55 children with ages ranging from 15 days to 35 months. Surgery was performed in deep hypothermia for congenital cyanotic and acyanotic heart disease. In 9 of the cases, an additional study was made of the patient's haemostasis at normal body temperature and later in deep hypothermia (average 23°C) before the heparin injection required for the extra-corporeal circulation. Test results showed, in deep hypothermia, a decrease of platelet count ($\bar{x} = 126000 \pm 62650/\text{mm}^3$), prothrombin value ($\bar{x} = 69.9 \pm 9.02\%$), fibrinogen ($\bar{x} = 1.84 \pm 0.41 \text{ g/l}$), a lengthening of thrombin time ($\bar{x} = 39.33 \pm 8.49 \text{ sec}$) and A.P.T.T. ($\bar{x} = 55.12 \pm 8.70 \text{ sec}$), an increase of fibrinolytic activity. Heparin level in the blood for the total group of patients (55) measured after rewarming and the neutralization of heparin by protamin, was found to be within acceptable bounds (0.10 - 0.20 UI/ml) in 41.81 % of the cases. In comparison, out of a group of 850 patients who underwent surgery and under moderate hypothermia (average 28°C) 68.88 % of the cases showed a satisfactory residual blood heparin level (0.10 - 0.20 UI/ml).

BLOOD COAGULATION IN HIGH ALTITUDE PULMONARY OEDEMA. I. Singh and I.S. Chohan. Directorate General Armed Forces Medical Services, New Delhi, India.

Blood coagulation studies were undertaken in patients of high altitude pulmonary oedema at 3,700 m, comparable controls, and sea level subjects to determine the possible causal connection between changes in fibrinolytic activity, blood coagulation factors, and formation of thrombi within the alveolar capillaries, venules and some branches of pulmonary arteries. The following changes have been observed: Fibrinolytic activity was reduced. Plasma fibrinogen and factor VIII were increased. Factor XII was decreased. Platelet adhesiveness and platelet factor 3 were increased and electrophoretic mobility of platelets reduced. The integrity of platelet plasma membrane, capacity of pseudopodia formation, and ability of degranulation remained intact. Both arterial and venous adenosine-5'-diphosphate (ADP) levels were low and there was evidence of excessive utilisation of ADP in the pulmonary bed. The findings suggest that sludging of RBCs and formation of thrombi possibly result from these changes, impede the pulmonary blood flow, and aggravate the disease.

Apart from inducing diuresis and reducing pulmonary blood volume, within 30 minutes of its administration intravenously, furosemide enhances fibrinolytic activity, decreases factors V, VIII and X and thrombotest activity, increases factor XII, reduces platelet factor 3 and adhesiveness, and improves clot retraction. It seems impediments to blood flow at capillary and venular level, which occur on account of the hypercoagulable state, are removed and pulmonary oedema is relieved.

HEMATOLOGIC AND COAGULATION MEASUREMENTS IN AUTOTRANSFUSED BLOOD, F.N. McKenzie, W. Wall, R.O. Heimbecker, R. Barr, A. Robert. Departments of Surgery and Medicine, University Hospital, and University of Western Ontario, London, Ontario, Canada.

Reinfusion of blood shed during elective or emergency vascular surgery (autotransfusion) is an under utilized technique. This is due in part to doubts as to the quality of autotransfused blood and concern about the risk of inducing a coagulopathy in the recipient. We have measured coagulation and hematologic parameters in autotransfused blood in the recipient before and at intervals after operation in 62 patients, none of whom received bank blood or blood products at the time of the study. The patients were heparinized (3 mg/Kg) during operation and this was reversed by protamine at the end of the procedure. The salvaged blood was reinfused immediately after appropriate samples had been taken. The mean volume of blood autotransfused was 1.8L in 58 patients and 9.4L in 4 patients. There was excellent preservation of platelets and fibrinogen, normal levels being maintained both in the autotransfused blood and in the recipients. Values for fibrin degradation products and euglobulin clot lysis remained normal. The mean plasma hemoglobin in the autotransfused blood was 416 mg% and this was not correlated to the volume autotransfused. Partial thromboplastin time which was prolonged by heparin during surgery was consistently normal post-operatively. No patient developed complications which could be attributed to autotransfusion and, in particular, re-operation for post-operative bleeding was never required and wound hematoma was not seen. We conclude that autologous blood may be returned to patients in large amounts without significant risk using the technique described. The technique deserves wider application in major surgery.