



## NCCU CLINICAL GUIDELINES

### SECTION: 9

## HAEMATOLOGY

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Polycythaemia and Hyperviscosity  
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## POLYCYTHAEMIA AND HYPERVISCOSITY

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Polycythemia is defined as a venous haematocrit (Hct) >65%. Capillary measurements are higher subject to variations in blood flow than venous samples and should be used only as a screening technique.

Hyperviscosity is related to the increased resistance to blood flow and therefore to a risk of circulatory impairment. It is common and partial exchange reverses the physiological abnormalities and ameliorates the symptoms but has not been shown to improve long term outcomes.

Polycythemia occurs as a result of increased red cell mass, with a decreased, normal or increased plasma volume. The hematocrit peaks at 4-6 hours of life, then drops slowly to the value at birth, thereafter it stays relatively stable. Because instruments to measure viscosity are mostly not available it is diagnosed by a combination of symptoms and Hct.

Conditions that predispose newborns to hyperviscosity include the following:

- Delayed cord clamping.
- Twin to twin transfusions.
- Maternal fetal transfusion.
- Prenatal asphyxia.
- Intrauterine hypoxia, e.g. SGA.
- Mat diabetes.
- Mat hypertension.
- Mat smoking.
- Rare fetal conditions like Beckwith-Wiederman and Trisomies 13,18 and 21

### CLINICAL FEATURES

- Lethargy and poor feeding.
- RDS, cyanosis
- CNS depression ~Tremors, jitteriness, seizures, coma.
- Hypoglycaemia in 12% to 40 %.
- Hypocalcaemia.
- Poor renal function.
- Jaundice
- NEC

- Cardiac symptoms such as tachypnoea, cyanosis, tachycardia, cardiomegaly in up to 50% of plethoric infants.
- Coagulation profile anomalies.

## TREATMENT

1. The goal is to decrease the haematocrit to 50-55%.
2. Where the blood volume is estimated at 90ml /kg the following formula is used to calculate the partial exchange volume.

$$\text{Vol Exchanged (ml)} = (\text{observed Htc} - \text{desired Htc}) / \text{observed Htc}$$

3. Normal saline is isotonic and safe as a partial exchange medium. Aliquots should not exceed approximately 5mL/kg and should be delivered or removed over 2-3 minutes.
4. Many studies have shown that although there is no evidence for an improvement in long term neurological outcome after partial exchange transfusion in symptomatic and asymptomatic infants. Partial exchange transfusion might be associated with an early improvement in some of the clinical symptoms associated with polycythemia and hyperviscosity.

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