Automated Red Cell Depletion by Apheresis for Erythrocytosis ("Erythrocytapheresis")

**Background:** Erythrocytosis can be primary, caused by polycythemia vera (PV), or secondary, such as due to cardiac or respiratory disorders, or excessive endogenous/exogenous erythropoietin. In the latest 2013 ASFA guidelines(1), PV is a category I indication for erythrocytapheresis, which means that it is considered first-line therapy. Secondary erythrocytosis is a Category III indication, which means that the role of apheresis therapy is not clearly established and decision making should be individualized.

Erythrocytapheresis has an important advantage over therapeutic phlebotomy, in that larger red cell volumes can be removed easily. A single 1½ -2 hour procedure in a patient presenting with a hematocrit (Hct) of 60% can drop the Hct to 45%. With phlebotomy, where each unit of whole blood removed decreases the Hct by about 3%, almost 4 units would need to be phlebotomized to achieve the same volume of red cell removal. Furthermore, this volume of whole blood cannot be removed safely without replacing with normal saline or albumin due to the hypotensive risk. With erythrocytapheresis, the volume removed is automatically replaced with saline or albumin to match the rate of removal, which may improve patient safety over therapeutic phlebotomy. The increased red cell volume removed with erythrocytapheresis allows the interval between procedures to be increased, and thus the overall number of procedures required to maintain the desired hematocrit is decreased(2), which may improve patient satisfaction. Studies show that the treatment interval with erythrocytapheresis ranges from 2-7 months, compared to 1-2 months with phlebotomy(3).

**Methods:**

1) As for any patient undergoing apheresis, the patient’s height, weight, and most recent CBC needs to be communicated to NYBC.

2) The target Hct as individualized for the patient’s clinical situation needs to be communicated to NYBC. For PV, the target end Hct would typically be ≤ 45%. For secondary erythrocytosis, the target end Hct might be higher.

3) The replacement fluid needs to be communicated to NYBC. 5% albumin would be the typical replacement fluid, although saline could be used if the change in hematocrit is small.

**References:**

