

## Blood transfusion strategy in pediatrics

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Homologous transfusion continues to be associated with risks for the recipient (hemolysis, infection, immunosuppression) and costs for the community despite progress in the quality management of collecting banking. To minimize risks and costs, the transfusion of homologous blood should be kept to a minimum by a team approach to blood conservation. Technological advancements in surgical and intensive care, anesthetic and perfusion techniques affect blood conservation. All described blood-sparing techniques are possible in children but are mostly neglected in infants or technical limitations may prevent their application. Transfusion at single arbitrary hemoglobine is particularly inappropriate in the peri-operative period. Hemoglobin transfusion threshold in surgical should be dependent of risks factors of tissue ischemia. Very few randomized clinical trials examining transfusion triggers are found in pediatric surgery patients. Children present with unique problems related to physiological anemia, small circulating blood volume, hemoglobin F and underdeveloped coagulation system. Preoperative autologous donation, an effective method to reduce the exposure to homologous blood in adults is more invasive and complicated in children. The preoperative low hemoglobin level in children is a major determinant for homologous blood transfusion.

Preoperative rHuEPO is an expensive therapy to reduce homologous blood transfusion. Optimization of response to rHuEPO and iron supplementation needs to be further studied in children. Efficacy of per-operative normovolemic hemodilution has not been established. Intra-operative autotransfusion has proved to reduce significantly exposure to homologous blood, but there are no established guidelines for cell salvage use in children. Minimal volume bowls or continuous centrifugation technology with less stagnate priming volume is needed to achieve the most efficient recovery of blood loss in pediatrics. The more delicate balance between coagulation and fibrinolysis, the higher susceptibility to exogenous stimulation and the lower level of clotting factors enhance per-operative bleeding. Wide variability in efficacy of the antifibrinolytic agents, aprotinin, tranexamic acid and epsilon-aminocaproic acid is age and dose dependent. Desmopressin has no effect on peri-operative blood loss in young children.

Techniques to minimize blood loss used in combination with pre- and/or postoperative rHuEPO, strict transfusion criteria, pre-operative autologous blood donation and intra-operative blood salvage result in low homologous transfusion.

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