

***INTRODUCTION
AND
HISTORICAL REVIEW***

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Exchange Transfusion is a procedure in which physicians caring for neonates are readily familiar and can be rapidly instituted in life-threatening situations.

The first Exchange Transfusion for Hemolytic Disease of Newborn was performed in Canada in 1925 by Hart, but no attention was paid to this novel approach to therapy until almost 20 years later when a similar procedure was popularized by Wallerstein (1946), Mollison (1948), Wiener (1949), and Diamond (1951) among others.

The results of Exchange Transfusion since then have been extremely gratifying, and the mortality of live-born affected infants has been greatly reduced as a direct result of therapy. (Penington et al., 1978).

The technique of Exchange Transfusion has undergone significant metamorphosis since it was first described by Hart, who used the longitudinal sinus via the anterior fontanelle and the saphenous vein for exsanguination and transfusion, respectively.

Diamond et al. (1951) improved the technique, using a plastic catheter in the umbilical vein.

A two-way technique of Exchange Transfusion involving withdrawal of blood from the sagittal sinus and replacement through a cannulated vein was proposed by Wallerstein (1946). Wiener and Wexler (1946) and Wiener et al. (1954) used a saphenous vein and the contralateral radial artery. This process cannot be used easily for repeated transfusions, and also carries risks from prolonged immobilization of the infant and local vascular impairment. Holman had tried umbilical artery catheterization unsuccessfully in 1948.

In recent years, the artery has been used for sampling and infusions (Saling, 1959; Grychtolik and Kolrep, 1961; Ainsworth et al., 1963; Cottom, 1963; Layrisse and Linares, 1964). Saling (1959) catheterized the two umbilical arteries immediately after birth of infants at risk, and performed exchange transfusions, if indicated, later on. Layrisse and Linares (1964) used an apparatus for simultaneous manual injection of blood through an umbilical artery and withdrawal from the umbilical vein (Ata and Holman, 1966).

Since 1951, several modifications of the Diamond single-site technique and of the original two-site technique have been described in attempts to avoid some real and potential hazards (Goldman & Tu, 1983).

During this same period, numerous modifications of the procedure have been suggested. Some have proved worth; while others have been discarded subsequently either due to clinical trials or advances in medical knowledge (Erlandson, 1963).