

# Nexus TKO<sup>®</sup>

## Anti-Reflux Device

### *Nexus TKO<sup>®</sup>-6P: Mechanical Hemolysis Study*

#### **Introduction**

Needle-free injection sites are commonly used to sample blood from a patient. Damage to the red blood cells releases hemoglobin into the serum and can cause inaccurate results for some laboratory tests.<sup>1</sup> This hemolysis results in increased costs and delays in therapy as a second sample must be obtained.

The design of the needle-free injection site may be a contributing factor in hemolysis, therefore an independent laboratory study was conducted on the Nexus TKO<sup>®</sup>-6P to determine the amount of hemolysis it created when utilized during a simulated blood draw.

#### **Methods**

The test employed human blood and a standard curve of human hemoglobin was prepared by using Drabkin's reagent. The amount of hemoglobin is then measured using spectrophotometry.

Using a syringe, 5mL of blood was aspirated through each test device. The blood was then expelled into a test tube. Blood samples were then centrifuged at 800 x g for 15 minutes, then 1mL of the supernatant was mixed with 1mL of Drabkin's reagent and allowed to stand for 15 minutes. The absorbance of the samples was read to determine the hemolysis concentration using the standard curve for each sample.

A negative control was also prepared by drawing blood directly into a syringe and then expelling into a test tube.

#### **Results**

The negative control had a hemolysis of 0.52% while the five TKO-6P injection sites had an average hemolysis of 0.50%.

#### **Conclusions**

Based on the results of the study the TKO-6P is considered non-hemolytic and therefore blood samples obtained through the TKO-6P would not cause red blood cells to lyse.

#### **Discussion**

The hemolysis values were well below the 5% limit, which demonstrates the TKO-6P injection site design and materials do not damage red blood cells. This study is limited to the injection site alone and does not take into account other factors such as the use of syringes versus vacuum tubes, lumen size of catheter/needle or the length of tourniquet time. These other factors may impact hemolysis of the blood sample leading to increased costs and delay therapy decisions.

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<sup>1</sup> Sharp MK, Mohammad SF. Hemolysis in needleless connectors for phlebotomy. *ASAIO J.* 2003 Jan-Feb.