Can Blood Drawing Technique in the NICU Be Standardized?

In this feature, Neonatal Intensive Care interviews clinicians and healthcare providers about the actual application of specific products and therapies. This interview is with Stacia Nickell RNC-NIC, BSN, Shift Coordinator IU Health, Riley Childrens Hospital with contributions from Bill Buss BS, Pharm D, Laura Smith RN, Shellie North RN, Jennifer Gearlds RN and the 230 Staff Nurses at Riley Childrens Hospital.

In search of the best method for Neonatal blood drawing that provides standardization, ease of use and good clinical results when used with all types of Central Line Catheters while providing a closed system in use…One level IV NICU's experience with the Hummi Micro Draw System.

Neonatal Intensive Care: In your level IV NICU what unique challenges do you have when needing to draw blood samples from premature infants, especially those who are transferred to you from other institutions and may have a need for various types of catheters to be placed?
Stacia Nickell: We receive the sickest newborns in the state of Indiana. Access can be a big issue and babies may be transferred in because of needed access. The Hummi Micro Draw System gives us the ability to draw blood easily from any line that we put in or receive from another hospital. It also allows us to draw a very small volume of blood as waste and give back that volume along with a very small volume of flush, helping us to reduce IVH risk.

NIC: Having a closed system for blood drawing has become the desired norm. What has been your experience in using closed systems commercially available for blood drawing in your level IV neonatal population?
SN: We have tried several different systems over the last few years. Some of the problems we observed were related to line clearance and flushing when running TPN with the devices we were using to draw our ABGs and Labs. Lab values were often inaccurate because the in line device was difficult to clear when used with Central venous lines. 3mL of clearance was often needed. We observed increases in infection rates possibly due to blood residual in the devices after blood drawing which was not clearing out with up to 3ml of flush. Blood exposure during use was also a problem with certain of these in line systems.

NIC: Approximately one year ago your NICU implemented the Hummi Micro Draw Closed System. What improvements vs. previous methods of drawing blood does the Hummi Micro Draw System offer to your patient population from a clinical standpoint?
SN: With the Hummi Micro Draw System we are able to standardize our clearance and flush volumes for Central Arterial and Central Venous lines. We standardized our waste/holding to 1.0 mL of blood and we do not have inaccurate labs. We run TPN through the Central Venous lines and with the Hummi Micro Draw it is very easy to flush any catheter with a standardized 0.6mL of flush after a blood draw. Actually, we do not need to draw blood into the line itself when using the Hummi Micro Draw, as the waste and sample are taken directly from the Catheter hub.

The great thing about the Hummi System is that it can be used successfully when any fluid is being administered through any type line. The draw volumes are small, and a small amount of flush completely clears the catheter. More importantly, we have had zero (0) infections with the Hummi Micro Draw system since its implementation.

NIC: Has the use of the Hummi Micro Draw improved your work flow at bedside when it comes to line setup, line maintenance and the blood drawing process?
SN: We change our fluids using an aseptic technique and the Hummi Micro Draw System fits easily into this process. The packaging is user friendly and it works nicely with our line set up with minimal components compared to other systems. The Hummi System has made our process more streamlined, and is very easy to use and easy to teach how to use.

NIC: What different types of catheters do you draw blood from using the Hummi Micro Draw system?
SN: We use the Hummi Micro Draw System for blood drawing on Central lines (subclavian. and jugular), Umbilical Arterial Lines, Umbilical Venous Lines, and IR placed PICC Catheters 2.4Fr. or larger. We also use the Hummi Micro Draw on Peripheral Arterial Lines placed in the OR and at bedside

NIC: Does drawing from different types of catheters require different equipment or techniques when using the Hummi Micro Draw?
SN: We have now standardized our blood drawing technique with the Hummi Micro Draw to 1.0mL waste and a 0.6mL flush for all type Central catheters. 95% of the time this works very well.

If needed for very low gestational age/weight babies we have the ability to reduce clearance and flush volumes with the Hummi Micro Draw as needed for different catheter sizes and still obtain accurate lab values. Also, if a slightly higher volume of clearance is appropriate for certain circumstances, we can increase our draw and flush volumes accordingly when using the Hummi Micro Draw without having to change line setup or line components.

If you would like to participate in this feature, as a company or healthcare provider, please contact Steve Goldstein at s.gold4@verizon.net.

NIC: Have you noticed an improvement in your infection rates since the adoption of the Hummi Micro Draw device? If the effect on infection rates is positive, how do you feel the Hummi Micro Draw System has contributed to lowering infection risk in your patient population?
SN: We have instituted various procedures over time to prevent infections such as our aseptic fluid change policy. And, since implementing the Hummi Micro Draw System and the improved line setup it provides, we have had **no infections** and our infection rate has decreased 58% over the previous year. Currently since implementation of the Hummi System we have a 0% infection rate.

The Hummi Micro Draw System helped us with improvements in our drawing technique and in our line setup by limiting open accesses to the line, not drawing blood into the line, elimination of blood residual in the line, reducing clearance and flush volumes and providing closed access ports for sampling, flushing and line change. These technique improvements all likely have contributed to the reduction in our observed infection rates.

NIC: What other procedures requiring blood collection have you used the Hummi Micro Draw device with successfully? What improvements do you see?
SN: We have now adopted the Hummi Micro Draw System for use in drawing Blood Cultures from our Central lines. Our procedure is to change the Hummi Micro T Connector used for access to a new one prior to the culture draw. We then access directly to the Catheter hub through the newly placed Micro T connector with the Hummi device and divert 1mL of blood prior to drawing the culture blood. After sampling we return the diverted blood to the patient. Using this technique has shown an improvement in our False Positive rates for Blood Cultures from our lines.

NIC: Has the implementation of the Hummi Micro Draw system allowed for standardization of the blood draw procedure throughout IU Health's NICU departments?
SN: Yes, we have 5 NICU's of different levels and we all use the Hummi Micro Draw for our blood sampling from all Central and Peripheral catheters. This has helped with ease of transferring babies as we are all using the same device and the same drawing technique. We have also been able to standardize our training for all NICUs for blood drawing and line setup to the Hummi Micro Draw System throughout the IU Health System.

NIC: Overall has the Hummi Micro Draw System performed to your clinical expectations for blood draw needs of a Level IV NICU?
SN: This device has performed above my expectations. We have been able to use it with all our lines and effectively draw labs without any issues. We have maintained a great low infection rate and it is easy to teach new nurses to use. Our doctors love this device and are impressed with the low draw volumes and the thinking behind how that helps reduce IVH risk. The device has allowed us to decrease the cost of repeat labs. My nursing staff was very excited to go to this device and can't believe we have ever used anything else.