DONOR CONNECT	Type: Work Instruction	Category: Organ Recovery
	Title: **Pediatric Blood Draw Guideline**	
	Document #: WI-OR-11	Revision: 1

DonorConnect Pediatric Blood Draw Guideline

Situation: Obtaining donor blood for organ packaging causes instability in pediatric donors in the ICU and the OR on both local and import donors.

Background: In the past, the OPO obtained donor blood for organ packaging in the OR prior to cross clamp in an attempt to reduce donor instability in the ICU due to blood loss. In some cases, drawing packaging blood right before cross clamp unfortunately ended up creating instability in the OR with the potential to affect the heart and other organ recovery. Surgeons have encountered the same issues when traveling to recovery at outside OPOs.

Assessment: The need was then for the OPO to find a way to get the required packaging blood before the OR without causing donor instability on both local and import hearts. After speaking with pediatric MDs and HLA staff, a guideline was made to best accommodate all parties and provide safe donor care.

*****HLA Information*****

Typing: The first set of blood being sent to H&I is used for typing. This is normally sent at the start of a case. Tying is DNA-based, so requires minimal blood. 1 ml of blood is usually sufficient to complete HLA typing (ACD, yellow tube). 5ml is the preferred amount but fill the tube full if possible.

Crossmatching: blood must not be older than 48 hours for crossmatches in ACD yellow top tubes. ACD tubes can be left out at room temp. Each tube must also have at least 5ml of blood or the ACD ratio will be off. The number of recipients at one center needing to be crossmatched will change the amount of total mls needed by the lab. Any blood transfusion given before crossmatch blood being drawn may dilute the specimen and may require more donor blood to be sent to the HLA lab. Please call and check with HLA tech if your donor has received blood transfusions before crossmatch blood being drawn.

Red Top tubes: are used by our local lab for tests like Chagas if requested by the transplant center or OPO at a later time. May also be used for ABO verification.

Calculated blood volume for pediatrics: this will help you know how much total blood volume your donor should have based on age and weight. You can use this as a tool to estimate what a reasonable amount of blood being drawn would be and to help people understand why it may not be possible to draw large volumes of blood at once.

https://www.omnicalculator.com/health/pediatric-blood-volume

The age factor equals:

100 mL/kg for premature infants; (example 5kg baby would have 500ml total blood volume)

85 mL/kg for babies younger than 3 months;

75 mL/kg for children over the age of 3 months;

70 mL/kg for male adolescents;

65 mL/kg for female adolescents.

Primary Children's lab blood draw volume: This hospital tries to stick with a 2ml/kg limit per day

UNOS policy for blood/material for packaging organs:

I spoke with a UNOS representative about pediatric guidelines. They informed me that they are aware that pediatric donors will likely not be able to meet the blood volume requirements for packaging organs and the OPO just needs to make a note as to why we were unable to send the below volumes.

Table 2-4: Minimum Typing Materials

The host OPO must provide:	For this organ:
One 7 to 10 mL clot red top tube	Any organ
Two acid-citrate-dextrose (ACD) yellow top tubes	Kidney or pancreas
If available, one 2 by 4 cm wedge of spleen in culture medium	Kidney or pancreas
Three to five lymph node samples	Each kidney or pancreas Any organ, if the receiving transplant hospital requests and they are available.

Recommendation:

1.) **Typing:** Call H&I tech at the start of a case. Inform them of pt age/weight/transfusion history. Usually, 1 ml in an ACD yellow tube should be enough for typing but provide them a full tube if possible.
2.) **Crossmatches:** when it is time to crossmatch see how many local recipients come up on the list. Once again call H&I and see how many mls of blood are required for best-case scenario. In general, 8-10 mls of blood (yellow ACD tube) yields enough cells to crossmatch at least 3 recipients (transfused donors may require more). If mls of blood needed is above the recommended amount plan to transfuse at least the amount drawn of PRBC after the blood draw. Have blood hanging and ready to go before blood being drawn and start your infusion immediately after.
3.) **OR packaging blood**: the best practice is to supply: heart/lungs/liver- 1 full red top, K/KP- 2 full yellow and 1 full red top. If organs are staying local and you are trying to save blood check with HLA tech as they may need less blood. There are two options for drawing blood. One is to draw this blood 12 hrs in advance and up to a few hours before the OR (always remembering you can give PRBC as needed after). The other option is to draw the entire required amount at least 2 hours before the OR so you have time to rapid transfuse PRBC after the draw and let the donor stabilize before OR. It may also be helpful to call the out of state accepting transplant centers if the donor is very small or unstable and have them check with their HLA lab about minimum required crossmatch blood needed as this amount varies based on the specific way they isolate cells. For most labs, 5-10cc from 1 yellow top should be enough.

Pediatric DCD: For DCDs use the above guidelines for blood ml amounts but also use your best judgment on donor stability. DCD donors may not need a transfusion post blood draws if they can remain stable enough to make it to set withdraw time.

VRL: Call and check with VRL lab at the start of the case about the minimum amount of blood needed for serologies.

Pediatric import donors, especially heart: Refer to 3. (above) for influencing outside OPOs' blood draws prior to the OR to maintain stability.