



Pediatric Specimen Collection Guide

Volume Types

Whole Blood

Drawn during venipuncture

Serum

Liquid remaining after blood has clotted

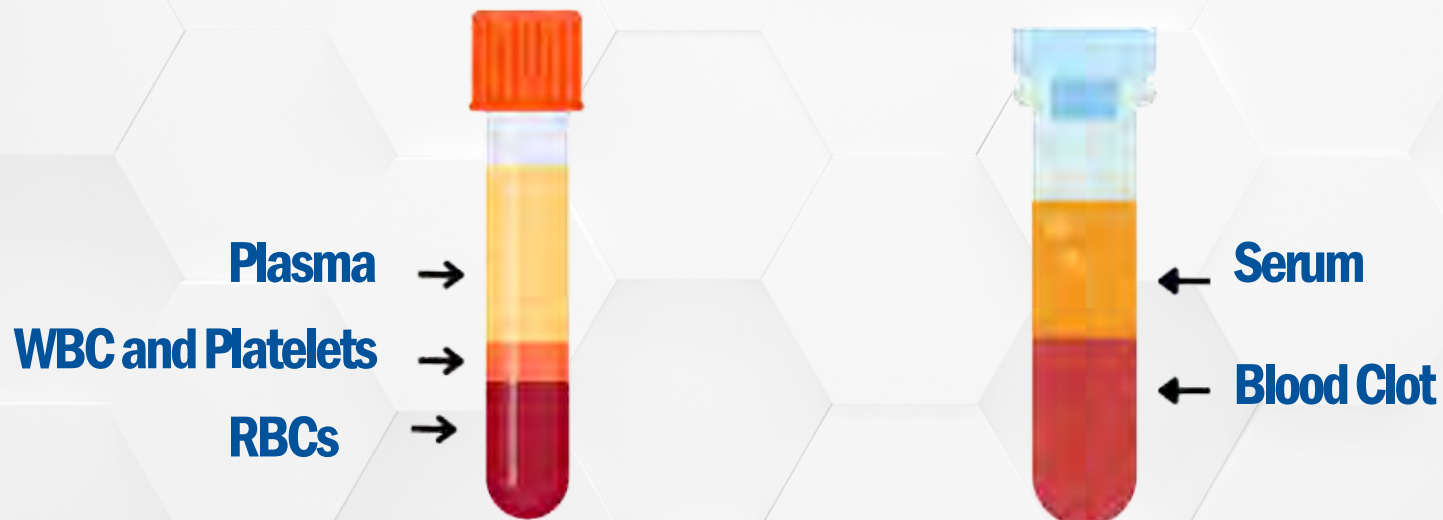
- Process: Blood sits to clot, then tube is centrifuged, and clot is removed. Remaining is serum.

Plasma

=

Whole blood minus blood cells

- Approximately 55% of blood concentration



How Much Do I Need?

- Determine if the minimum volume is in serum, plasma, or whole blood.
 - If serum or plasma, draw **approximately** 2 ½ times the requested volume in whole blood.
- In newborns or children with **elevated hematocrit** (>50%), additional volume **will be necessary** for serum or plasma testing.
 - Available testing volume is dependent on patient hematocrit.
 - **↑ hematocrit = ↓ serum volume**
 - Newborns have higher hematocrit and subsequently lower serum/plasma.

Before Centrifugation

Filled with 600 µl of whole blood



After Centrifugation

< 200 µl Serum available to test



← **Serum Available for Testing**

Preventing Hemolysis and Clotting

Before Collection

- **Appropriate Needle Sizes**
 - Smaller needles have higher risk of RBC destruction during collection.
- **Smaller Syringe Sizes**
 - Avoid line draws when possible. If pulling off a line, higher pulling pressure from larger syringes can split RBC's. Pull slowly with a smaller syringe.
- **Closer to the Source**
 - More connections or ports for blood to flow through with varying diameters increases chance of RBC's splitting.
- **Skin Prep Dry Time**
 - Allow the skin prep to dry before venipuncture. Skin prep products can hemolyze RBC's.

During Collection

- **Bevel Placement**
 - The needle bevel should not be partially occluded or resting on the vein wall as this increases shearing pressure on RBC's.
- **Fill Volumes**
 - Fill tubes to recommended volumes including coagulation studies. Tubes containing additive need appropriate blood/additive ratios to prevent the additive from affecting the sample.
- **Tourniquet Release**
 - Release the tourniquet as soon as blood flow is established. Goal – tourniquet on no more than 1 minute after initial placement.

After Collection

- **Tube Inversion**
 - Gently invert tubes 8-10 times, avoid vigorous mixing!

Helpful Tip:

Pre-warming of infant heels enhances blood-flow. Excessive milking will cause hemolysis.

Microtainers

After centrifugation, specimens of the same tube type collected at the same time can be combined.

This is ONLY for specimens collected at the same time.

Examples:

- Neonatal Bilirubin: Gold Tube or Light Green Tube
- Neonatal TPN Profile: Gold Tube or Light Green Tube
- Gentamycin Peak: Light Green Tube

Collect ALL in Light Green Tubes to allow for combining of serum /plasma in the lab.

Volume Per Microtainers

Tube	Volume
Lithium Heparin (Green)	400 µl
SST (Gold Top)	500 µl
Citrate (Blue)	1.8 ml
Sodium Fluoride (Grey Top)	600 µl
EDTA (Lavender Top)	500 µl

****Disclaimer! - Minimum values are based on a hematocrit of 50 or lower. Any pediatric patient with a higher hematocrit WILL REQUIRE additional volume for testing to be completed ****



GREEN WITH GEL - LITHIUM HEPARIN (LiHep)

Test	Plasma/ Serum	= Whole Blood	Alternative Collection	Microtainers	Available Stat	Test Type
Albumin (ALB)	100 µl	200 µl	SST (GoldTop)	1	Yes	Chemistry
Alanine Aminotransferase (ALT)	100 µl	200 µl	SST (GoldTop)	1	Yes	Chemistry
Alkaline Phosphatase (ALPH)	100 µl	200 µl	SST (GoldTop)	1	Yes	Chemistry
Aspartate Aminotransferase (SGOT)	100 µl	200 µl	SST (GoldTop)	1	Yes	Chemistry
Basic Metabolic Panel (BMP)	200 µl	400 µl	SST (GoldTop)	1	Yes	Chemistry
Bilirubin, Direct (DBIL)	100 µl	200 µl	SST (GoldTop)	1	Yes	Chemistry
Bilirubin, Total (TBIL)	100 µl	200 µl	SST (GoldTop)	1	Yes	Chemistry
Bilirubin, Total, Neonatal (NBIL)	100 µl	200 µl	SST (GoldTop)	1	Yes	Chemistry
Calcium (CA)	100 µl	200 µl	SST (GoldTop)	1	Yes	Chemistry
Chloride (CL)	100 µl	200 µl	SST (GoldTop)	1	Yes	Chemistry

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Test	Plasma/ Serum	= Whole Blood	Alternative Collection	Microtainers	Available Stat	Test Type
Comprehensive Metabolic Panel (CPMP)	200 µl	400 µl	SST (GoldTop)	1	Yes	Chemistry
Creatinine (CREAT)	100 µl	200 µl	SST (GoldTop)	1	Yes	Chemistry
Creatine Kinase, Total (CK)	100 µl	200 µl	SST (GoldTop)	1	Yes	Chemistry
Liver Function Panel (LFP)	150 µl	250 µl	SST (GoldTop)	1	Yes	Chemistry
Magnesium (MG)	100 µl	200 µl	SST (GoldTop)	1	Yes	Chemistry
Phosphorous (PHOS)	100 µl	200 µl	SST (GoldTop)	1	Yes	Chemistry
Potassium (K)	100 µl	200 µl	SST (GoldTop)	1	Yes	Chemistry
Sodium (NA)	100 µl	200 µl	SST (GoldTop)	1	Yes	Chemistry
TPN Panel, Neonatal (NTPN)	200 µl	400 µl	SST (GoldTop)	1	Yes	Chemistry

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GREEN WITH GEL - LITHIUM HEPARIN (LiHep)



Test	Plasma/ Serum	= Whole Blood	Alternative Collection	Microtainers	Available Stat	Test Type
Urea Nitrogen (BUN)	100 µl	200 µl	SST (GoldTop)	1	Yes	Chemistry
Uric Acid (UA)	100 µl	200 µl	SST (GoldTop)	1	Yes	Chemistry
Carnitine Panel (CARN)	200 µl	400 µl	Sodium Heparin (Green)	1		Referral Test
Amino Acid (Plasma)	250 µl	500 µl	Sodium Heparin (Green)	2		Referral Test
Growth Hormone	400 µl	800 µl	SST (GoldTop)	2		Referral Test

GREEN - SODIUM HEPARIN



Test	Plasma/ Serum	= Whole Blood	Alternative Collection	Microtainers	Available Stat	Test Type
Chromosomes		2 ml		FULL SIZE TUBE		Referral Test

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GOLD OR RED W/GEL - SERUM SEPARATOR (SST)



Test	Plasma/ Serum	= Whole Blood	Alternative Collection	Microta iners	Availiable Stat	Test Type
C Peptide (CPEP)	100 µl	200 µl		1		Chemistry
Cortisol (CORT)	200 µl	400 µl		1		Chemistry
C-Reactive Protein (CRP)	100 µl	200 µl		1		Chemistry
Digoxin (DIG)	100 µl	200 µl		1	Yes	Chemistry
Insulin (INSU)	250 µl	500 µl		1		Chemistry
Prealbumin (PREA)	100 µl	200 µl		1		Chemistry
T3, Total (T3T)	200 µl	400 µl	SST (RedTop)	1		Chemistry
T4, Total (T4)	200 µl	400 µl	SST (RedTop)	1		Chemistry
TORCH Screen	250 µl	500 µl	SST (RedTop)	1		Chemistry
17 OH Progesterone	300 µl	600 µl	Lithium Heparin (Green)	2		Referral Test
Fatty Acid Free	200 µl	400 µl		1		Referral Test

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GRAY 10mg/8mg OXALATE WITH FLOURIDE



Test	Plasma/ Serum	= Whole Blood	Alternative Collection	Microtainers	Available Stat	Test Type
Lactate/Lactic Acid (LACT)	100 µl	200 µl		1	Yes	Chemistry

RED NO GEL



Test	Plasma/ Serum	= Whole Blood	Alternative Collection	Microtainers	Available Stat	Test Type
Gentamicin Level, Random (GENR)	100 µl	200 µl	SST (GoldTop)	1	Yes	Chemistry
Phenobarbital Level (PHEN)	100 µl	200 µl	SST (GoldTop)	1	Yes	Chemistry
Beta Hydroxybutyrate (BHBA)	0.5 ml	500 µl		1	Yes	Toxicology

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LIGHT BLUE - SODIUM CITRATE



Test	Plasma/ Serum	= Whole Blood	Alternative Collection	Microtainers	Available Stat	Test Type
D-Dimers		1.8ml		1	Yes	Hematology & Coag
Factor VIII & IX		1.8ml		1		Hematology & Coag
Fibrinogen		1.8ml		1	Yes	Hematology & Coag
PT/PTT/INR		1.8ml		1		Hematology & Coag

Note: A full blue top microtainer must be collected for Coagulation studies. A full lavender top must be collected for Hematology studies.

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LAVENDER - EDTA (Lav EDTA)



Test	Plasma/ Serum	= Whole Blood	Alternative Collection	Microtainers	Available Stat	Test Type
Ammonia (NH4)	100 µl	200 µl		1	Yes	Chemistry
B-Type Natriuretic Peptide(BNPT)	200 µl	400 µl		1	Yes	Chemistry
CBC		375 µl		1	Yes	Hematology & Coag
HIV Antigen/Antibody (HIVAA)	400 µl	800 µl		2		Serology
HIV-1 Proviral DNA (HIVPV)		1 ml		2		Referral Test
HIV-1 Viral Load (HIV1L)		2ml		4		Molecular

NOTE: Estimated whole blood volume is impacted by the patient's HCT. High HCT will decrease the amount of serum/plasma. In these cases, collection of the listed whole blood may not provide adequate volume for testing. Volume above is based on a HCT of 50%.

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Questions?

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