

## MINIMUM PEDIATRIC TEST REQUIREMENTS

Often, only a small volume of blood can be drawn from a pediatric patient. For maximum benefit from the limited sample, the specimen is handled individually, with special emphasis on micro techniques and procedures designed to conserve the specimen. Duplicate determinations (the standard procedure for assuring accurate results) may not be done if the sample is not large enough to perform all the requested tests.

This section lists the **minimum** sample volume required for individual tests or test combinations. Please consult the tables before collecting the blood specimen.

When collecting blood specimens (venous, capillary, arterial) from newborns, we recommend the use of yellow top microtainers for all chemistries. In addition, the minimum whole blood requirements listed below are based on an average hematocrit value of 0.50. The resulting volume of serum after centrifugation and separation from the gel should meet the minimum amount of serum required to do one analysis & one repeated test of the specimen. Further repeat analysis would require collection of additional blood samples.

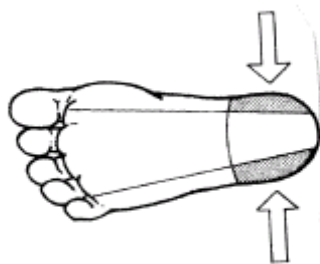
### **Newborns – 6 months:**

When collecting blood specimens on babies 0 – 6 months of age, blood specimens should be obtained primarily by heel punctures. When collecting for coagulation, amino acids, lactic acid, DNA analysis & other whole blood samples venipuncture is the method of choice

### **> 6 months:**

When collecting blood specimens on babies or children > 6 months of age, heel punctures should be avoided. Instead, finger punctures or venipuncture should be used to obtain blood. When collecting for coagulation, amino acids, lactic acid, DNA analysis & other whole blood samples venipuncture is the method of choice

Heel punctures must be done in suitable areas of the heel only. See diagram.



**Order of Draw: (capillary draw)**

1. LAVENDER
2. YELLOW TOP

**Order of Draw: (venous draw)**

1. BLOOD CULTURES
2. BLUE TOP – coagulation
3. RED TOP – all drug levels
4. NAVY BLUE – metals except aluminum
5. YELLOW TOP – bilirubins and chemistry
6. GREEN TOP (lithium heparin or sodium heparin) – amino acids, venous blood gas
7. LAVENDER – hematology, ammonia, DNA analysis, group & screen, DAT
8. BLACK TOP – ESR levels (if patient 6 years & older)
9. NAVY BLUE (with EDTA) - aluminum
10. GREY TOP – lactic acid

**NICU collections – special considerations:**

- Collections must be done through the isolette portholes. Do not open the isolette.
- Lights must be kept on if baby under the lights for hyperbilirubinemia.
- Bilirubin specimens must be collected in amber SST microtainers or protected from light by foil wrap.

## CHEMISTRY & SPECIAL TESTS

Most common tests listed here. For other tests not listed see Specimen Collection Guidelines.

ASSAY	MINIMUM VOLUME BLOOD (ml)	TUBE	TESTING FACILITY
Acetaminophen	0.5	1 red top Microtainer	UHNBC
Albumin	0.5	1 SST Microtainer	UHNBC
Aluminum	3.0	Navy top – with K2EDTA	VGH
<a href="#">Amino Acids</a> (fasting 4-5 hours prior to test)	2.0 ml whole blood Collect on ice. Must be processed within 15 minutes.	1 – 2.0 ml green top - <b>Lithium Heparin</b>	BCCH
Ammonia	1 ml whole blood Collect on ice. Must be processed within 15 minutes.	1 - 3 ml Lavender top (EDTA)	UHNBC
ASOT  • Antistreptolysin-O	0.2	1 SST Microtainer	UHNBC
Bilirubin (Total and/or Direct)	0.5	1 SST <b>Amber</b> Microtainer	UHNBC
BUN	0.25	1 SST Microtainer	UHNBC
BNP	0.5	1 SST Microtainer	UHNBC
C Reactive Protein (CRP)	1.0	2 SST Microtainer	
Calcium	0.25	1 SST Microtainer	UHNBC
Carbamezepine	0.5	1 red top Microtainer	UHNBC
Carbon Dioxide	0.25	1 SST Microtainer	UHNBC
CD4/CD8	Min: 1 ml Optimal: 5 ml whole blood	2 EDTA lavender Microtainer	
Chloride	0.25	1 SST Microtainer	UHNBC
Cholesterol	0.25	1 SST Microtainer	UHNBC
Complement C3	0.25	1 SST Microtainer	UHNBC
Complement C4	0.25	1 SST Microtainer	UHNBC
Copper	Min: 1.0 Optimal: 2.0	Navy top tube – no additive	BCCH
Cortisol	0.25	1 SST Microtainer	UHNBC
Creatinine	0.25	1 SST Microtainer	UHNBC

ASSAY	MINIMUM VOLUME BLOOD (ml)	TUBE	TESTING FACILITY
<a href="#">Cytogenetics</a> <ul style="list-style-type: none"> <li>chromosome analysis, blood</li> <li>karyotyping</li> </ul> use <a href="#">BCCH Cytogenetics requisition</a>	1.0 ml whole blood	1 Green top <b>Sodium Heparin</b>	BCCH
Digoxin  Random: >6 hrs post dose	0.5	1 red top Microtainer	UHNBC
Dilantin see Phenytoin			
<a href="#">DNA analysis</a>  Use <a href="#">BCCH Molecular Cytogenetics requisition</a>	3.0 ml whole blood.	1 - 3 ml Lavender top (EDTA)	BCCH
Ferritin	0.25	1 SST Microtainer	UHNBC
<a href="#">Fragile X</a>  Use <a href="#">BCCH Molecular Cytogenetics requisition</a>	3.0 ml whole blood (EDTA) & 1.2 ml whole blood (Sodium Heparin)	1 Lavender top (EDTA) & 1 Green top <b>Sodium Heparin</b>	BCCH
FSH	0.25	1 SST Microtainer	UHNBC
FT4	0.25	1 SST Microtainer (	UHNBC
<a href="#">G-6PD</a>	1.0 ml whole blood	2 -EDTA lavender Microtainer	BCCH
Gentamicin	0.5	1 red top Microtainer	UHNBC
Glucose	0.25	1 SST Microtainer	UHNBC
<a href="#">Growth Hormone</a>	1.0	2 Red top Microtainer	
HgbA1c	0.25	1 EDTA lavender Microtainer	UHNBC
Haptoglobin	0.25	1 SST Microtainer	UHNBC
Hep A IgM	0.5	1 SST Microtainer	UHNBC
Hep A total Antibody	0.5	1 SST Microtainer	BCCDC
Hep B Core IgM	0.5	1 SST Microtainer	BCCDC
Hep B Core Total Antibody	0.5	1 SST Microtainer	UHNBC
Hep B Surface Antibody	0.5	1 SST Microtainer	UHNBC
Hep B Surface Antigen	0.5	1 SST Microtainer	UHNBC
Hepatitis C	1.0	2 SST Microtainer	BCCDC
<a href="#">Immunoglobulins</a>  IgA, IgG, IgM	1.0	2 SST Microtainer	UHNBC

ASSAY	MINIMUM VOLUME BLOOD (ml)	TUBE	TESTING FACILITY
<a href="#">Insulin</a> <ul style="list-style-type: none"> <li>Fasting preferred</li> <li>If diagnosis is neonatal hypoglycemia, collect growth hormone &amp; cortisol</li> </ul>	1.0	2 red top Microtainer	BCCH
<a href="#">IGF-1</a> <ul style="list-style-type: none"> <li>Insulin-like growth factor</li> <li>Somatomedin C</li> </ul>	1.0	2 red top Microtainer	BCCH
Lactic Acid	1.2 ml whole blood Collect on ice. Must be processed within 15 minutes.	1 grey top tube	UHNBC
Lead	Min: 1ml whole blood Optimal: 4 ml whole blood	Navy top tube – no additive	BCCH
Magnesium	0.25	1 SST Microtainer	UHNBC
Osmolality	0.5	1 SST Microtainer	UHNBC
Phenobarbital	0.5	1 red top Microtainer	UHNBC
Phenytoin  aka: Dilantin Random:>6 hrs post dose	0.5	1 red top Microtainer	UHNBC
Phosphorous	0.25	1 SST Microtainer	UHNBC
Potassium	0.25	1 SST Microtainer	UHNBC
<a href="#">Pyruvate kinase</a>	1ml whole blood. Collect on ice.	2 - EDTA lavender Microtainer	BCCH
Rheumatoid Factor, Quantitative	0.25	1 SST Microtainer	UHNBC
<a href="#">Rubella</a>	1.0	2 SST Microtainer	BCCDC
Salicylate	0.5	1 red top Microtainer	UHNBC
Selenium	Min: 1.0 Optimal: 2.0	Navy top tube – no additive	BCCH
Sodium	0.25	1 SST Microtainer	UHNBC
Theophylline  Random: >6hrs post dose	0.5	1 red top Microtainer	UHNBC
Tobramycin	0.5	1 red top Microtainer	UHNBC

ASSAY	MINIMUM VOLUME BLOOD (ml)	TUBE	TESTING FACILITY
<a href="#">TORCH screen</a> (Toxoplasmosis, Rubella, CMV, Herpes screen)  Maternal samples must also be collected.  Use <a href="#">PHSA serology requisition</a>	2 ml	4- SST Microtainer	BCCDC
TSH	0.25	1 SST Microtainer	UHNBC
Valproic Acid	0.5	1 red top Microtainer	UHNBC
Vancomycin  Trough: ½ hr before dose Peak: 3 hrs after end of Infusion Random: >6 hrs post dose	0.5	1 red top Microtainer	UHNBC
Vit B12	0.25	1 SST Microtainer	UHNBC
<a href="#">Zinc</a>	Min: 1.0 Optimal: 2.0	Navy top tube – no additive	BCCH

## HEMATOLOGY TESTS

ASSAY	MINIMUM VOLUME BLOOD (ml)	TUBE
CBC & automated diff	0.5	1 EDTA lavender Microtainer
CBC & manual diff	0.5	1 EDTA lavender Microtainer
CBC & reticulocyte	0.5	1 EDTA lavender Microtainer
CBC & ESR	1 ml	2 EDTA lavender adult tube
ESR only	1 ml	2 EDTA lavender adult tube
INR APTT FIBRINOGEN (any combination)	1.8 ml	<b>*Special coagulation tube – phone Hematology – loc. 2440</b>  <b>Note:</b> If more than 2.7 ml of blood can be drawn then use a 2.7 ml Sodium Citrate tube for coagulation tests.

**\* Obtain a special coagulation tube from Hematology. This tube has no vacuum so blood should be collected with a syringe then exactly 1.8ml of blood transferred into the tube. This ensures that the optimal ratio of blood to anticoagulant is obtained and valid coagulation results can be reported.**

## TRANSFUSION SERVICE

ASSAY	MINIMUM VOLUME BLOOD (ml)	TUBE
Group & Crossmatch	1.0	2 EDTA lavender Microtainer
DAT	0.5	1 EDTA lavender Microtainer

## MICROBIOLOGY

ASSAY	MINIMUM VOLUME BLOOD (ml)			TUBE
	PATIENT WEIGHT	MIN. VOLUME	OPTIMAL VOLUME	
Blood Culture	< 1 kg	0.4 ml	0.5 – 1.0 ml	Pediatric blood culture bottle (yellow cap)
	1 – 3 kg	0.5 ml	1.0 ml	
	3 – 10 kg	1.0 ml	3.0 ml	
	10 – 20 kg	1 – 2 ml	3.0 ml	Collect one Pediatric bottle up to a maximum of 4ml.
	20 – 35 kg	4.0 ml	5 – 10 ml	
	>35 kg	4.0 ml	10 ml	

## URINE TESTS

(store tests below in fridge while collecting volume)

ASSAY	MINIMUM VOLUME BLOOD (ml)	TUBE
CMV	Min: 5ml Optimal: 10 ml	Orange top container
<a href="#">PHSA virology requisition</a>		
Drug Screen	10	Orange top container
Organic Acids	10-20	Orange top container
Reducing Substances	10	Orange top container

**REFER TO THE ALPHABETICAL LIST OF TESTS IN THE UHNBC DIRECTORY OF TESTS FOR FURTHER INFORMATION.**