ORDER OF DRAW

POLICY STATEMENT

All PathWest Laboratory Medicine WA pathology collectors will collect blood sample tubes in a recommended order of draw to avoid cross contamination of additives between tubes and will determine the minimum blood volume needed according to test requirements, patient age and weight-based limits.

INTENT

To provide clarity and understanding to PathWest collection staff about the correct order of draw to be used when collecting blood samples while avoiding possible test error due to cross contamination of the sample by tube additives.

SCOPE

All appendices of the policy apply to all PathWest staff performing phlebotomy collections and can be provided to clinical hospital ward staff and external clients who request the PathWest policy be used in their clinical setting. Appendices can be found at: Appendix B: Blood Order of Draw Guide - Vacutainer and Appendix C: Blood Tube Order of Draw Guide - Microtainer. A summarised version of the vacutainer order of draw guide can be found in document: PSCP028.

RESPONSIBILITIES

Employee

- Ensure they are familiar with the Order of Draw policy and how to access electronic or hardcopy information prior to performing specimen collection.
- To collect blood samples in the correct order prescribed by the Order of Draw policy to avoid cross contamination of additives between tubes.
- Read, sign and date document updates to acknowledge understanding of changes or amendments to the Order of Draw policy and forward acknowledgement to manager.

Specimen Collection Coordinator / Medical Scientist in Charge

- Ensure all staff have electronic or hardcopy access to the policy.
- Ensure all staff receive training and comply with the PathWest Order of Draw policy when collecting blood samples.
- Ensure the recommended Order of Draw is included in the staff annual competency assessment and records.
- Ensure all superseded documentation is replaced with the current version and staff are notified of any changes.

Document Author

- Undertake regular review, update documentation and maintain records of the notification date and the list of sites to which the documents are distributed.

Marketing

- Notify and inform external clients of changes to the policy including the distribution of updated documentation pertaining to the PathWest Order of Draw.
- Maintain register of external clients, including records for notification of updates i.e. date, reason for contact and name of PathWest staff member responsible for notifying clients.

Notes – Vacutainer Order of Draw

1. When collecting blood using a syringe and a transfer device is used; the below order of draw is to be followed.
2. When using a syringe and siphoning the bloods directly into the tubes, the Order of Draw (in order) is: Blood Gas Syringe, EDTA tubes, Sodium Citrate tubes, all other anticoagulant tubes, Serum/Clot tubes.
3. When collecting blood via a capillary collection method (heel/finger prick) refer to Appendix C: Blood Tube Order of Draw Guide - Microtainer.
4. When performing Paediatric Collections please refer to Appendix A for Blood Collection Volume Guidelines.
5. Haemolysis Warning - Never inject blood into the collection tube through a needle from a syringe.
6. Always mix the blood with anticoagulants gently but thoroughly inverting the tube 6-8 times.
7. Do not shake tubes (exception is QuantiFERON, which are to be inverted vigorously 10 times)
8. Do not top up or transfer blood from one tube to another as this will result in additive transfer and the samples to be rejected due to contamination.
9. This is a guide only. For all Point of Care Tests, or if you have any queries or require further information, please refer to the PathWest Test Directory or contact your local laboratory prior to sample collection.
10. Use of a winged collection set/ butterfly requires the collection of a discard tube if the first tube to be collected is a blue top Sodium Citrate tube or black top ESR tube. This discard tube will prime the tubing of the collection set and ensure that the correct anticoagulant/blood ratio is maintained. The discard tube should be a non-additive or light blue coloured tube and need not be filled.

Notes – Capillary Order of Draw

1. When performing Paediatric Collections please refer to Appendix A for Blood Collection Volume Guidelines.
2. Never scrape the Microtainer against the finger or heel during collection, as this can cause haemolysis, introduce tissue fluid contamination, and compromise specimen integrity.
3. When performing paediatric collections, if after consultation with the Test Directory the required blood volume **exceeds** the guidelines stipulated above for the weight of the child; please contact the testing laboratory to obtain tube minimisation advice.
4. Blood collected via capillary (i.e., heel prick or finger prick) is not suitable for coagulation studies. For this reason, Sodium Citrate microtainers have not been included in this order of draw.

APPENDIX A

Blood Collection Volume Guide for Paediatric Blood Collection

Weight (kg)	Max. Draw (mL) per collection episode
1	2.4
2	4.8
3	7.2
4	9.6
5	12
6	14.4
7	16.8
8	19.2
9	21.6
10	24
11-15	27.3
16-20	37.8
21-25	48.3
26-30	58.8

(Royal Children's Hospital Melbourne, 2018).

REFERENCES

- Child and Adolescent Health Service. (2025). *Capillary blood sampling (heel and finger prick)* (Capillary Blood Testing (Heel and Finger Prick) [Clinical nursing manual]. Community Health, Government of Western Australia.
- Clinical and Laboratory Standards Institute. (2020). *Collection of capillary blood specimens* (7th ed.; CLSI document GP42–Ed7). CLSI, Human Ability. (2025). *HLTPAT012: Perform capillary blood collections* (Release 1).
- Royal Children's Hospital Melbourne. (2018). RCH Paediatric *Blood collection Volume Guide*

Blood Tube Order of Draw Guide - Vacutainer

General instructions

- Label samples with patient's **full name**, **date of birth** and **date/time** of collection, as well as **collector's signature**
- Anatomical collection site labelling for blood culture bottles only
- Check expiry date of containers prior to collection
- For information regarding collection requirements for pathology testing, including what blood tube/s are required, refer to PathWest's test directory

Hemogard™ Closure & Tube	Test Requested	Special Instructions
BLDCULT **Blood Cultures** 	**Blood Culture** Investigation of a systemic bacterial or fungal infection	**Must** be collected using strict aseptic technique. **Always collect using a winged infusion/butterfly** First collect aerobic (grey/blue top) container followed by the anaerobic (purple/pink top) Pink top is Paediatric (collected as an alternative for both bottles involved in the adult set for children) If Myco/F Lytic bottle is required, collect immediately after the other blood culture bottles Recommend at least 2 sets from a single site for routine collections, or 3 sets from 3 sites for? Endocarditis
BLUE **Sodium Citrate (3.2%)** 	**Coagulation Testing** e.g. INR, APTT, Coagulation profile, D Dimer, Protein C/S, ATIII, Prothrombin Time	**Must** be filled to the clear <u>minimum</u> fill line marked on the tube. Send to the Lab within 4 hours of collection otherwise separate the centrifuged plasma within 4 hours of collection and transport frozen (depending on test requirements).
BLACK **ESR - Sodium Citrate** 	**Erythrocyte Sedimentation Rate (ESR)**	**Must** fill tube to midway between marked lines **N.B.** can be collected at the end of the draw as tests performed on this tube not compromised by other additives **N.B. Foam inserts** recommended if transporting glass tubes through the pneumatic chute system
ACD **Acid Citrate Dextrose** 	**HLA Studies**	Store at room temperature.
RED **Serum [No Gel]** 	**Therapeutic Drug Levels, antibiotic assays and drugs of abuse** **N.B.** - a red top non-gel serum tube is preferred when collecting **outside** the metropolitan area. For collections in the metropolitan area please use a lithium heparin (dark green top – see below) [Use EDTA for Anti-Rejection Drugs] **Lithium assays can only be performed on a serum (red top) tube**	**Record** Time & Date of Last Dose, Dosage and Collection Date & Time on the request form

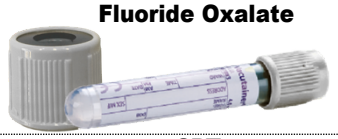
Blood Tube Order of Draw Guide - Vacutainer

Hemogard™ Closure & Tube	Test Requested	Special Instructions
GOLD **SST / Serum [with Gel]** 	**Most Referred Biochemistry** [i.e. Tests that take >1day for a result] **All Viral Serology,** **Most Immunology & Hormone Testing**	
DARK GREEN (DKGNLITH) **Lithium Heparin [No Gel]** 	**Troponin I & Creatinine [A&E I STAT ONLY]** **Therapeutic drug levels, antibiotic assays and drugs of abuse** **N.B**. A dark green top non-gel lithium heparin tube is preferred for samples collected **within** the metropolitan area. **N.B. Please refer to your local testing laboratory for D-Dimer collection requirements.** **Do NOT collect gel tubes for D-dimer assays** **Do NOT collect Lithium Heparin (Green top) tubes for Lithium assays**	**DO NOT SPIN** **DO NOT REFRIGERATE**
GREEN **PST / Lithium Heparin [with Gel]** 	**Locally Performed Biochemistry** [e.g. UEC, LFT, Lipids (Chol/Trig), HDL, CK, Lipase, CRP, Ca2+, Phos, Mg2+, LDH, NT proBNP, Cardiac Enzymes, Gamma GT, Bicarbonate, Uric Acid, Protein, Glucose (See **N.B.**)	Tests must be performed within 4 hours of collection for valid K+, or centrifuge tubes and store as per local guidelines." **N.B.** If delivery will take more than 2hrs before sample can be centrifuged GREY must be collected for glucose.
GREEN NA **Sodium Heparin [No Gel]** 	**Some chromosomal studies** [e.g. Karyotype, FISH]	**DO NOT SPIN**
QUANT **4 Qiagen QuantiFERON TB In Tube vials** 	**Interferon Gamma Testing for TB.** First-line Interferon-gamma release assay against tuberculosis-specific antigens, and used for the diagnosis of latent tuberculosis	Order of collection for QuantiFERON tubes: Grey, Green, Yellow, Purple **Must** be filled to the fill line marked on the tube. **When using a butterfly needle, collect a purge tube before collecting specimens**
QUCMV **3 Qiagen QuantiFERON CMV in Tube vials** 	**Interferon Gamma Testing for CMV.** First-line Interferon-gamma release assay against CMV antigens, and used for the monitoring of CMV	Order of collection for QuantiFERON CMV tubes: Grey, Blue, Purple **Must** be filled to the fill line marked on the tube. **When using a butterfly needle, collect a purge tube before collecting specimens.**
LAVENDER (and LAV9) **EDTA (K2EDTA)** 	**Blood Count**: FBC, FBP, CBC, WCC, Hb, Plt **Glycated Hb:** HbA1C **Malaria** **Anti-Rejection Drugs** [e.g. Tacrolimus, Sirolimus]	Do not separate

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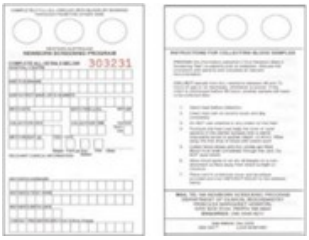
PathWest LABORATORY MEDICINE WA

Blood Tube Order of Draw Guide - Vacutainer

Hemogard™ Closure & Tube	Test Requested	Special Instructions
PINK **EDTA (K2EDTA)** 	**Cross Matching** and all related blood bank tests [e.g. Group & Hold, antibody screening, blood group]	**REMINDER: Minimum** labelling is **FULL NAME & DOB, TIME & DATE of COLLECTION, and COLLECTORS SIGNATURE/ INITIALS on both form & tube, All these details on the tube and form must match.** A formal declaration printed on the request form **must be** signed by the collector. Samples that do not meet these requirements will be rejected by TM.
PEARL **PPT/K2EDTA [with Gel]** 	**Parathyroid Hormone (PTH) Quantitative PCR** If an EDTA Gel tube is not available, please contact your local testing laboratory for further advice.	**N.B.** Do not confuse with PTH related protein (PTHrp) which requires a special tube. Please contact your local laboratory.
STRECK **Cell-Free DNA BCT (STRECK)** 	**Non-Invasive Prenatal Testing (NIPT) – Percept Screen for Victorian Clinical Genetics Services (VCGS)** **Clinical Trial Investigations**	**Do not use winged infusion / butterfly for collection** **Do not collect immediately after a heparin tube (collect an EDTA in-between as a discard tube if necessary).**
NAVY **EDTA Trace Metal** 	**Blood Lead & Other Heavy Metals**	**Always collect using a winged infusion / butterfly if collecting for Chromium, Zinc and Cobalt.** Collect using a Winged Infusion Set (Butterfly Needle) and prepare a second (replacement) luer adapter. The first luer adapter must be changed immediately prior to collecting the Trace Metal tube to prevent contamination. Subsequent tubes can then continue to be collected as per the recommended order of draw.
GREY **Fluoride Oxalate** 	**Glucose:** BSL, Sugar, Blood Sugar	**N.B.** If delivery will take more than 2hrs before sample can be centrifuged, GREY must be collected.
CPT **Cell preparation Tube (Sodium Citrate & Ficoll Hypague)** 	**T Spot TB Assay (i.e., Interferon Gamma ELISPOT Assay for Tuberculosis)**	**Must** be stored, collected and delivered upright
RhD NIPT **PAXgene Blood ccfDNA** 	**Non-Invasive Prenatal Screening for Fetal RhD**	**Always collect using a winged infusion / butterfly**
Blood Gas Syringe 	**Venous or Arterial Blood Gases** For venous / arterial blood gas testing.	**Always collect using a winged infusion / butterfly** Collect separately removing the luer adaptor from the winged infusion/butterfly and directly connecting the BGS to avoid contamination. Transport at room temperature and test within 30 minutes of collection. **N.B. The pneumatic tube system is not recommended for transport of these samples as analytes may be affected.**

Blood Tube Order of Draw Guide - Microtainer

PathWest Recommended Capillary Order of Draw

Microtainer	Test Information	Mix by Inverting
	Heparinised Capillary Blood Gas Seal both ends with caps	Mix sample in an infinity (∞) motion, while inverting for a minimum of 20 seconds
LAVENDER 	**Blood Count**: FBC, FBP, CBC, WCC, Hb, Plt **Malaria (Thick & Thin Films), BNP** **Anti-Rejection Drugs** [e.g. Tacrolimus, Sirolimus]	8 - 10 times
LITHIUM HEPARIN 	**Chromosome Studies (Blood)** Paediatric Lithium Heparin sample is acceptable for patients aged <5 years. **Do NOT collect Lithium Heparin (Green top) tubes for Lithium assays**	8 - 10 times
LITHIUM HEPARIN AND GEL 	**Locally Performed Biochemistry** [e.g. UEC, LFT, Lipids (Chol/Trig), HDL, CK, Lipase, CRP, Ca2+, Phos, Mg2+, LDH, NT proBNP, Cardiac Enzymes, Gamma GT, Bicarbonate, Uric Acid, Protein, Glucose (See **N.B.**) **N.B**.: If delivery will take more than 2hrs before sample can be centrifuged, GREY must be collected. **Do NOT collect Lithium Heparin (Green top) tubes for Lithium assays**	8 - 10 times
FLUORIDE OXALATE 	If delivery will take more than 2hrs before sample can be centrifuged, GREY must be collected for Glucose samples.	8 - 10 times
SERUM WITH GEL 	Serology, immunology, and hormones	5 times
SERUM NO GEL 	Therapeutic Drug Levels, antibiotic assays and lithium.	N/A
NEWBORN SCREENING (GUTHRIE CARD) 	**Collected 48 – 72 hours after birth.** **The infant's heel must not contact the card; only blood drops should be applied to the back of the card to soak through.**	Fill each circle on the blood spot card by allowing a single blood drop to flow naturally from the back to the front side of the card. Contact between the sampling site and the card must be avoided.