TRINITY COLLEGE DUBLIN

PHLEBOTOMY

Trinity College Dublin,

Email: ____________@tcd.ie
Telephone: +353 1 896 ___
<table>
<thead>
<tr>
<th>CONTENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emergency Contacts .........................................................</td>
</tr>
<tr>
<td>SOP – Management of Adverse Events .....................................</td>
</tr>
<tr>
<td>SOP – Action in the event of and in response to Fire alarm activations: ................................</td>
</tr>
<tr>
<td>SOP – Guiding principles ........................................................</td>
</tr>
<tr>
<td>SOP – Personal protective equipment (ppe) ..................................</td>
</tr>
<tr>
<td>SOP – Spill Handling Procedure ...............................................</td>
</tr>
<tr>
<td>SOP – Generally Precautions ..................................................</td>
</tr>
<tr>
<td>SOP – Phlebotomy .....................................................................</td>
</tr>
<tr>
<td>SOP – Safety Guidelines for Disposal of Sharps ...............................</td>
</tr>
<tr>
<td>SOP – Transport within Building ...............................................</td>
</tr>
<tr>
<td>SOP – Biological Safety Cabinet ...............................................</td>
</tr>
<tr>
<td>SOP – Centrifuge Safety ..........................................................</td>
</tr>
<tr>
<td>SOP – Lab Biosecurity .............................................................</td>
</tr>
<tr>
<td>SOP – Consumable Ordering ....................................................</td>
</tr>
<tr>
<td>SOP – Processing Bloods ............................................................</td>
</tr>
<tr>
<td>SOP – Cleaning .....................................................................</td>
</tr>
<tr>
<td>SOP – Waste Management ........................................................</td>
</tr>
</tbody>
</table>
# EMERGENCY CONTACTS

<table>
<thead>
<tr>
<th>PI/Manager:</th>
<th>Ext: ... or prefix 01-896....</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Safety Officer(s):</th>
<th>Ext: ... or prefix 01-896....</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dr.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>First Aider(s):</th>
<th>Ext: ... or prefix 01-896....</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**College Health**

<table>
<thead>
<tr>
<th>College Health Centre</th>
<th>Ext: 1591 or 1556 or mobile (01) 896-1591/1556</th>
</tr>
</thead>
</table>

**Security**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
</table>

**Repairs/faults**

<table>
<thead>
<tr>
<th>TRINITY COLLEGE Buildings Office: <a href="mailto:repairs@tcd.ie">repairs@tcd.ie</a></th>
<th>Plumbing, Gas or Electrical Faults: Ext 1828 (Outside office hours: Ext 3999)</th>
</tr>
</thead>
</table>
### Venous Spasm

<table>
<thead>
<tr>
<th>Cause</th>
<th>Venous spasm is caused by fear and anxiety and is usually stimulated by cold infusates and mechanical or chemical irritation</th>
</tr>
</thead>
</table>
| Signs | • Expressions of pain  
• Cramping  
• Numbness above the venepuncture site |
| Prevention | • Explain the procedure to reduce fear and anxiety |
| Treatment | • Gently massage or warm the limb and retry  
• Slow down the process of venepuncture (there is no need to remove the needle)  
• Wait for the vein to relax before proceeding |

### Haematoma

| Cause | Leakage of blood at the site of the venepuncture, may collect as a haematoma  
• Inappropriate use of a small fragile vein, or too large a needle  
• Excessive probing to find the vein  
• Removing the needle prior to releasing the tourniquet  
• The needle going all the way through the vein  
• The needle only partially entering the vein, allowing leakage |
| Signs | • Expressions of pain, loss of mobility or reluctance to move the affected limb  
• Swelling, discoloration or coolness of the area adjacent to the puncture site |
| Prevention | • Selection of appropriate equipment for the size of the vein  
• Skilled technique |
| Treatment | • Release the tourniquet, remove the needle and apply pressure until haemostasis has been achieved  
• Elevate the limb and apply a cool compress if necessary, avoiding an ice burn  
• Apply a pressure dressing if bleeding is persistent  
• Explain what has happened and request that staff are informed if the area becomes more painful as the haematoma may be pressing on a nerve  
• Do not reapply the tourniquet to the affected limb  
• Request a medical review, if required  
• Monitor, treat as prescribed and document in the nursing care plan  
• Report the occurrence of this complication, as per local organisational policy |
<table>
<thead>
<tr>
<th><strong>Phlebitis</strong></th>
<th>Phlebitis is an acute inflammation of the intima of a vein (Dougherty, 2008).</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cause</strong></td>
<td>• Localised infection or irritation of the vein caused by the introduction of the venepuncture needle (mechanical phlebitis)</td>
</tr>
</tbody>
</table>
| **Signs**    | • Expressions of pain (verbal or non verbal)  
• Loss of mobility or reluctance to move the affected limb  
• Redness, inflammation, or purulent ooze at the venepuncture site |
| **Prevention** | • Early detection is crucial, with regular monitoring required |
| **Treatment** | • Observe and monitor the venepuncture site  
• Assess the degree of phlebitis  
• Take a swab of the site for culture and sensitivity  
• Clean and apply a dressing, to the affected area and administer analgesia as prescribed  
• Report the incident of this complication  
• Treat as prescribed and document the care given |

<table>
<thead>
<tr>
<th><strong>Nerve Injury</strong></th>
<th>Nerve injury is an inadvertent injury to the nerve.</th>
</tr>
</thead>
</table>
| **Cause**       | • Inappropriate selection of the venepuncture site  
• Poor technique |
| **Signs**       | • Pain described as an ‘electrical shock’ or a ‘pins and needles’ sensation  
• Loss of mobility or reluctance to move the affected limb |
| **Prevention**  | • Appropriate clinical assessment  
• Appropriate site selection  
• Skilled technique |
| **Treatment**   | • Release the tourniquet, remove the needle and apply gentle pressure  
• Explain and reassure the patient about what has occurred  
• Advise that any symptoms of altered sensation may persist for a few hours  
• Arrange a medical review, if required  
• Monitor, treat as prescribed and document in the nursing care plan  
• Finally, report the occurrence of this complication, as per local organisational policy |
<table>
<thead>
<tr>
<th>Arterial Puncture</th>
<th>The inadvertent puncture of the artery is another complication associated with venepuncture.</th>
</tr>
</thead>
</table>
| **Cause**         | • Inappropriate selection of the venepuncture site  
                   • Poor technique                                                                          |
| **Signs**         | • Presence of bright red blood  
                   • Expressions of pain                                                                      |
| **Prevention**    | • Appropriate clinical assessment  
                   • Appropriate site selection  
                   • Skilled technique                                                                      |
| **Treatment**     | • Release the tourniquet, removing the needle immediately and apply pressure until haemostasis has been achieved  
                   • Explain and reassure regarding what has happened  
                   • Request that a member of staff is informed if bleeding recurs from the puncture site, if pain continues or if there is increasing swelling or bruising  
                   • Arrange a medical review  
                   • Monitor, treat as prescribed and document in the nursing care plan  
                   • Report the occurrence of this complication, as per local organisational policy |

<table>
<thead>
<tr>
<th>Needle Stick Injury</th>
<th>A needle stick injury (percutaneous inoculation injury) is an inadvertent puncture of the skin with a potentially contaminated needle.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cause</strong></td>
<td>• Inadvertent puncture of the skin during the venepuncture procedure</td>
</tr>
</tbody>
</table>
| **Signs**           | • Pain  
                   • Bleeding  
                   • A visible puncture of the skin of the nurse or midwife                                                                     |
| **Prevention**      | • The application of Infection Prevention & Control and Health and Safety Policy will support safe practice                      |
| **Treatment**       | • Encourage the wound to bleed freely (do not suck the wound)  
                   • Wash the affected area with liquid soap under running water  
                   • Apply a waterproof dressing over the affected area  
                   • Report the incident to your line manager  
                   • Record the incident accordingly by completing the relevant incident form  
                   • Submit the incident form to your risk manager or line manager  
                   • For follow-up and advice, contact your Occupational Health Dept and/or the Accident and Emergency Dept as per local organisational policy |
NAUSEA AND VOMITING

- If nausea occurs, instruct the Donor to breathe slowly and deeply.
- Apply cold compresses to forehead and neck.
- Have basins and tissues available.
- If severe, assist the Donor to a side lying position with their head slightly elevated.
- When the episode subsides, give the donor plenty of clear fluids.

DIZZINESS AND FAINTING

- Discontinue the phlebotomy procedure.
- If the Donor is seated, assist them to a lying position within the chair.
- Place the Donor on his back, lower his head and raise his feet above the level of his head.
- Loosen any restrictive clothing.
- If the donor fell, check for injuries.
- Assess the Donors airway (i.e., Is the Donor breathing? If not, proceed with CPR. If the adverse event cannot be dealt with appropriately on site then call an ambulance - dial 66-2222.
- Monitor the Donor for signs of recovery.
- Converse with the Donor and observe for other symptoms.
- Slowly return Donor to upright position.
- Do not release Donor until completely recovered. If complete recovery does not occur within 30 minutes contact College Health to evaluate.

ACCIDENTAL WOUNDS CAUSED BY CONTAMINATED SHARPS:

- Wash off splashes on skin with soap and water;
- Encourage bleeding if the skin has been broken;
  - Wash well under running water using soap (do not scrub)
  - cover with a dry dressing
- Wash out splashes in the eye preferably using eye wash from a fresh eye-wash bottle (or eye-wash fountain) for 15mins;
- Record source of contamination (name/date/material ref:/type of injury);
- Ensure that the Safety Officer is informed promptly and that an accident report form is sent.
- Every effort should be made to identify the specimen or other material concerned in the exposure, which, if blood, must be retained against any need to test for HIV, HCV or HBV infection.
SOP – ACTION IN THE EVENT OF AND IN RESPONSE TO FIRE
ALARM ACTIVATIONS:

SOP #: Phle02
Revision #: 01
Implementation Date: __/__/__
Approval Authority:

What to do if you discover a fire

- Quickly remove any contaminated PPE
- Raise the alarm at the nearest break glass unit (BGU) / alarm call point
- Leave your building immediately using the nearest exit route, closing doors behind you.
- Notify Security at ext. 2147 or mobile 01-8962147
- Report to your assembly - point

Note:
Do not fight fire unless safe to do so and trained in use of extinguishers.
Do not fight fire unless alarm is raised first.
Report extinguishers that have been used, so
that they can be replaced. (Buildings Office – ext. 1216, email: repairs@tcd.ie)

Contractors at work in or on the exterior of a building must comply with the above instructions also
(including dialling 2147 or the Fire Brigade and assembling at TCD designated Assembly Points.

What to do if the fire alarm sounds

- Quickly remove any contaminated PPE
- Leave your building immediately using the nearest exit route
- Close doors behind you as you leave
- Move away from the building
- Assemble at your assembly point
- Do not re-enter building until authorised to do so and fire alarm is switched off

Remember:

Check and familiarise yourself with the nearest exit(s) from your building, break glass units and the location
of your Assembly Point.
Note: on assessment of the incident, those assembled may need to be moved to an alternative Assembly Point
location.

Only use Fire Extinguishers if safe to do so and you have been trained.
Do not take risks.
Do not return to the building for any reason, unless authorised
Do not use lifts.
Keep Exit Routes clear at all times
Keep your area clean, tidy and clutter free. Remove rubbish regularly and report any electrical faults to extn.
1216 / 1828
SOP – GUIDING PRINCIPLES

SOP #: Phle03
Revision #: 01

REFERENCES:

Phlebotomy guidelines - Phlebotomists Association of Ireland Ltd. www.pairl.ie; info@pairl.ie

GUIDELINES

Abide by National Guidelines for phlebotomy.

Although the employer is liable for the wrongs of his employees if they are committed within the scope of their employment, the phlebotomist remains accountable individually for his/her actions. He/she should therefore, comply with the accepted standards of his/her profession. The standard expected is that he/she exercises the skill of a competent person exercising that skill.

The phlebotomist should follow the safe practice specified in the National Guidelines, while taking account of local requirements in his/her employing institution. Where these diverge, the phlebotomist should bring the National Guidelines to the attention of the employer. All policies should be in writing.

The phlebotomist should be conversant and compliant with all health and safety and infection control guidelines laid down by TCD.

The phlebotomist should be satisfied that he/she is adequately trained and assessed to be competent to carry out a particular procedure, before carrying out that procedure. He/she should not carry out procedure that he/she has not been trained for or that he/she does not feel competent to perform.

The phlebotomist should be aware of the legal and ethical principles applicable to his/her profession. The Phlebotomist should also be aware of and consult local Ethics Guidelines.

The phlebotomist should be familiar with the ethical principles applicable to the healthcare profession and behave in a professional manner at all times.

Where a phlebotomist suspects or recognizes a discrepancy or error in instructions or orders given, he/she should bring this to the attention of the Researcher ordering the blood draw or giving the instruction.

The phlebotomist should take reasonable precautions to ensure that he/she is not rendered incompetent by reason of health to carry out duties. Where any condition exists to impede proper standards of procedure, he/she should not proceed with the task. Under no circumstances can the phlebotomist practice while under the influence of alcohol or non-prescribed or nonapproved drugs.

The phlebotomist should not behave in a manner which members of his/her profession would consider inappropriate, dishonourable or disgraceful.

Any form of sexual advance to a Donor with whom there exists a professional relationship will be regarded as professional misconduct.

It is not within the scope of the phlebotomist’s practice to inform donors of the nature of the tests/research to be carried out or the implications or results of any test/research that he/she may have had. However, the phlebotomist should interact with the Donor and can clarify the
tests/research in order to help the Donor to give informed consent and to promote compliance with necessary instructions. Detailed queries should be referred to the appropriate Researcher.

All research studies involving human subject blood draws are required to obtain Ethical approval of the research protocol prior to initiating blood draws. The Phlebotomist should ensure the Ethics Committee has given approval and follow approved protocol.

SAFETY TRAINING

The Principal Investigator is responsible for verifying that phlebotomist performing blood draws have sufficient training and experience in conducting human blood sampling. Qualifications should include specific phlebotomy training with prior experience. Additionally, the lead Consultant must also formally delegate duties within a clinical study to a phlebotomist by means of a Responsibilities Log (or equivalent) which must include the roles undertaken, start date on the study and each entry must be signed off by the named Consultant.

Members of the profession should keep themselves informed of current advances that affect their profession. It is the personal responsibility of each practitioner to maintain his/her level of competency in practice to remain updated.

To maintain the highest standards, it is expected that each phlebotomist will adopt this code of Practice and will adhere to the National Guidelines in Phlebotomy

An individual may require refresher training if they have not practiced their phlebotomy for over one year.

All personnel working in the Phlebotomy Room must undergo additional training:

- Biosafety training
# SOP – PERSONAL PROTECTIVE EQUIPMENT (PPE)

**SOP #: Phle04**  
**Revision #: 01**  
**Implementation Date:** __/__/__  
**Revision #:** 0  
**Approval Authority:**

## GLOVES

<table>
<thead>
<tr>
<th>PPE</th>
<th>Specific type (example)</th>
<th>Comments</th>
</tr>
</thead>
</table>
| Latex or nitrile gloves | Disposable latex gloves | ✓ Good for biological laboratories  
| | | ✓ Good for dilute acids and bases  
| | | ✓ Good for double gloving  
| | | ✓ Poor for organic solvents  
| | | ✓ Difficult to detect defects or punctures  
| | | ✓ Can trigger latex allergy  
| Disposable nitrile gloves | | ✓ Good alternative to latex for biological laboratories  
| | | ✓ Good indication of tears and defects  
| | | ✓ Good for solvents, oils, greases and some acids and bases  
| | | ✓ Good for incidental chemical contact  

### Rules for glove use in the labs:

- **Wear gloves no longer than 1 hour** and dispose of when overtly contaminated or when the integrity of the glove is compromised.
- **Wash hands once gloves have been removed** and discarded in a biohazard bag, never re-use.
- Remove gloves before touching personal items, such as phones, computers, pens and one’s skin.
- **NEVER wear gloves out of the lab.** If gloves are needed to transport anything through hallways, use a secondary container and carry clean gloves in your hand to put on when you arrive at your new location.
- In certain circumstances, **double gloving** may be required to provide additional protection.
Correct removal of gloves

Hand washing

1. Wet hands under running water
2. Use sufficient soap to cover surface of hands
3. Rub hands with palms meeting
4. Rub right palm over the back of left hand up to the wrist and do the same with the other hand
5. Rub left palm over back of right hand with fingers interlinked then reverse
6. Rub palm to palm with the fingers interlaced
7. Make circular rubbing of clasped left thumb, then reverse
8. Rub the tips of the fingers against the opposite palm using a circular motion. Also ensure nail beds are washed
9. Wash soap off hands with water
10. Turn off taps using elbows
11. Dry hands with paper towels
12. Dispose of paper towels in waste bin.
### EYE PROTECTION

| ![Eye Protection Diagram] | Safety glasses with side shields provide the minimum level of protection for handling any hazardous material.  
Eye and face protection must meet the ANSI Standard Z87.1. They should fit well around the eye area. If large gaps are present around the eyes or slippage occurs, try another style.  
Safety glasses or goggles should be worn over glasses to offer proper protection. Wearing contact lenses in the laboratory is acceptable and requires the same level of eye protection as if they were not worn. |

| ![Goggles Image] | Goggles, which unlike safety glasses fit tightly all around the eyes are required for activities with a small splash hazard and/or spill response. |

---

**Laboratory Coat:**

A white "Howie"-style lab coat has been deemed the most appropriate pattern/style for College laboratories.

**Laboratory Coat Storage, Donning and Doffing**

**Storage:**

1. Lab coats must stored in a well-defined place;
2. Separate storage (e.g. pegs) is required for personal clothing and laboratory coats;
3. Lab coats should be checked and cleaned at suitable intervals;
4. PPE including lab-coats must be removed on leaving the phlebotomy area;
5. Lab coats must NOT be worn into areas designated as “clean” such as staff lounges, restrooms, office areas, or institutional common areas (i.e. cafeteria, hallways, etc.);
6. Soiled lab coats must kept apart from uncontaminated clothing and decontaminated/cleaned or, if necessary, destroyed.

**Donning (putting on):**

1. Remove the Howie-style lab coat from its storage location and minimise contact with the outer surfaces of the coat;
2. Hold the lab-coat so that the opening faces you;
3. One arm at a time, don the lab coat and pull up over the shoulders;
4. Completely fasten the lab-coat right up to the neck-line ensuring that personal clothing is completely covered including scarves and hoodies.

**Doffing (taking off):**

1. Unfasten the lab-coat;
2. For storage on pegs in the open lab; place a forefinger under cuff of sleeve and pull sleeve down over hand. With hand inside the first sleeve, draw second sleeve down over hand and slip off the lab coat and place on the hanger.

**Laboratory Coat Laundry**

1. **Contaminated coats**
   a. Must be rendered safe (based on the advice below) and washed by a commercial approved laundry service. Contact the College Biosafety officer (manganfr@tcd.ie) for a list of approved service providers.
   b. Do not use a local laundrette/dry cleaner as they generally are not familiar with proper handling of potentially contaminated items.
   c. Some College Departments have laundry facilities in place to facilitate sterilising wash. No washing machine must be purchased without the involvement of Buildings Office. There are requirements for the fitting of non-return valves to prevent backflow of contaminants into the mains water system.

2. If it is not possible to satisfactorily render the lab coat safe to be handled by the laundry or the contamination cannot be dealt with safely, then dispose of it via the waste handling route appropriate to the contamination.
3. If it is known or suspected that the laboratory coat has become contaminated with biological agents, it must first be autoclaved or soaked in an appropriate disinfectant and left for the requisite time period followed by rinsing and then laundering.
4. When placing lab coats in the laundry be sure that the lab coat is adequately labelled; place the Department/researchers name on the inside of the collar, and write the name of the laboratory on the front pocket of the lab coat. Write this information using a permanent marker. After a few washings, the labels will fade, so remember to re-label the coats prior to each laundering.
5. Ensure lab coat pockets (all of them) have been emptied before sending them for laundering.
# SOP – SPILL HANDLING

## STEP 1

Remove one of the Hypaclean Disposable Clean-Up Packs

## STEP 2

- Don Laboratory coat (Howie Style, NISO standard).
- Face protection (goggles, mask), Disposable Gloves (2 pairs).
- Disposable shoe covers.
- Disposable apron.

For **Risk Group 2 material**, alert laboratory personnel to the spill, leave the laboratory immediately. Restrict access for at least 30 minutes, Depends on: concentration; volume & air change rate.

### Option 1: STEP 3

- Sprinkle Presept granules over spill
- Remove soaked granules using scoop and scraper to biohazard bag.

### Option 2: STEP 3

- Cover spill with absorbent wipe and gently pour/soak with 1% Virkon – 10g/L, leave for 10 minutes, and up to 20 minutes (Risk Group 2 agents).
- Remove the contaminated absorbent wipe and place it in a biohazard bag.

## STEP 4

Wipe the surface with disinfectant and clean pad(s), and then place the wipe(s) in the biohazard bag. Repeat with water.

## STEP 5

Remove outer pair of gloves, shoe covers & apron & dispose of in the biohazard bag. Tie bag and dispose of as biohazard waste

## STEP 6

Remove inner pair of gloves and dispose of as biohazard waste, wash hand thoroughly.
Restrict access to authorised persons only; signage, swipe access and/or locks.

Gloves, lab-coat, protective eyewear, plastic apron, use plastic disposable overshoes when the floor is likely to be contaminated.

Leave personal items such as mobiles, pens, pencils, brushes, cosmetics and handbags, etc in the lockers.

Minimise the creation of splashes or aerosols – use a Biological Safety Cabinet where appropriate.

Spillage of material that could be infectious, treat as per SOP, and report the incident to the Safety Officer.

Work surfaces/equipment must be decontaminated with 1% Virkon then 70% IMS prior to and after activities.

Wash hands prior to & after removing gloves, & before leaving the lab. Avoid hand-to-mouth/eye contact.

Cuts, abrasions, dermatitis or other open wounds must cover with waterproof bandages, then double gloves.

No eating, drinking, smoking, applying cosmetics or storing food.

Take particular care in handling and disposal of sharps. Approved bin for contaminated sharps.

Ensure effective disinfectants and hard copies of the Spill procedures are available.

Large Yellow Clinical Waste bin, for disposal contaminated soft waste. See waste SOP.
SOP – PHLEBOTOMY

SOP #: Phle07  Implementation Date: __ / __ / __

Revision #: 00  Approval Authority:

BOOKING

1. Initial enquires should be advised that blood from screened, anonymised sources such as out-of-date or surplus transfusion blood should, where practicable, be used.
2. Phlebotomists/Researchers taking or handling human blood should receive appropriate vaccination and post vaccination testing, which is available from College Health.
3. Prior to obtaining bloods, researchers must submit evidence of their approved Project Risk Assessment; Ethical Approval and Consent Forms to the Phlebotomist and or PI/Consultant.
4. The Phlebotomist is responsible for liaising with Donors to agree appointment times and document donations in the record book.
5. The record book should document the frequency of donations and flag/prevent situations where donations exceed 100ml in 1 month and/or 10 donations in a 12 month period.
6. Donations by an individual of <50ml must be interspersed by a minimum period of 2 weeks to facilitate recovery.
7. The record book must document the Phlebotomist name, Study number, Anonymised ref No., Donor’s name, Donation date/time, volume collected, total collected.
8. The record book must be stored securely by the Phlebotomist and retained for 10 years;
9. To ensure the donor remains anonymous; researchers must not be given access to view the log.
10. Advise researchers that they must refrain from working with their own blood samples and ensure that donors are not colleagues working in the vicinity of the researcher.
11. The Phlebotomist must familiarise themselves with the information/consent form and explain the contents and blood collection procedure to the donor.
12. If for any unforeseen reason the appointment is cancelled, it remains the responsibility of the Phlebotomist to contact the donor to rearrange the appointment.

EQUIPMENT (Vacutainer and Vacuette Safety Blood Collection Systems)

- Double-ended Vacutainer needle or butterfly needle and vacutainer adapter
- Appropriate skin antiseptic - 2% chlorhexidine gluconate in 70% isopropyl alcohol pad
- Gauze
- Adhesive bandage and/or tape
- Alcohol hand rub/gel
- Tourniquet
TAKING SPECIMENS OF HUMAN BLOOD

PREPARATION / CONSIDERATIONS

1. Phlebotomy should be performed according to the recognised national standard and comply with all phlebotomy related SOP’s and work instructions.
2. Confirm that a first-aider is readily available to assist (if required).
3. Ask whether the donor has allergies, phobias or has ever fainted during previous injections or blood draws.
4. Donors must read and sign the Consent Form before blood is taken.
5. Never attempt venipuncture more than twice in one session – seek the assistance of a colleague if unsuccessful on the first attempt.
6. Never draw in any area that contains a hematoma, edema, burns, or scars.
7. Using a vacuum collection tube is safer than using a syringe and needle, as the blood does not have to be expelled into a separate container and the outside of the tube cannot be contaminated in the same way as traditional collecting tubes.
   a. Transfer of specimens collected using a syringe and needle to a blood collection tube is not recommended as this additional manipulation of sharps such as hollow bore needles increases the potential for needle-stick injury.
   b. Transfer of specimens from a syringe to an evacuated tube using a non-sharps device should be performed with caution for the reasons outlined below:
      i. Depressing the syringe plunger during transfer can create a positive pressure, forcefully displacing the stopper and sample, causing splatter and potential blood exposure.
      ii. Using a syringe for blood transfer may also cause overfilling, or under filling of tubes, resulting in an incorrect blood-to-additive ratio and potentially incorrect research results.
8. The research participant’s mouth will be free from food or gum prior to venepuncture.
9. All sample containers and equipment needed to competently and efficiently carry out the venepuncture must be assembled prior to the procedure.
10. The phlebotomist must position themselves on the same side as the arm from which blood will be drawn (usually non dominant hand).
11. Needles must never be broken, bent or recapped.
12. The Phlebotomist will take care to prevent needle stick injuries when using and disposing of
needles.
13. Blood collection tubes must not be labelled in advance of venepuncture.
14. A clearly identifiable label/sticker must be applied to all blood samples immediately after
venepuncture. The label should detail sample identifier, date/time, along with the name and
phone number of the Researcher responsible.
15. A puncture-resistant sharps container will be placed as close to the use-area as practical.
16. Check donor vital signs and check if the donor has been fasting for relevant samples
17. During collection it is important to avoid possible backflow from blood collection tubes that
contain chemical additives which may result in the possibility of an adverse Donor reaction.

Four Step Approach – Clinical Assessment

Check

18. The indication for venepuncture to determine equipment and specific bottles to use
19. If the volunteer has fasted as required for specific tests
20. Location and length of the vein
21. Condition of the vein (visual and palpation)
22. Area is warm prior to the venepuncture procedure (veins constrict if cold, making the procedure
more difficult)
23. Allergies to topical anaesthetic agents or plasters
24. For needle phobia
25. Previous history of difficult venepuncture procedures
26. Increased amounts of subcutaneous fat
27. For history of blood borne viruses, bleeding disorders or if receiving anticoagulation therapy

Choose

28. Most distal aspect of the vein
29. Non dominant hand
30. Correct location, avoiding arteries and nerves
31. Appropriate equipment to undertake procedure
32. Appropriate topical anaesthetic agent

Avoid

33. Hard, sclerosed, fibrosed, knotty, thrombosed veins or previous venepuncture sites
34. Valves in the vein (if visible or palpable)

Do Not Use

35. Arm with obvious infection or bruising
36. Arm with a fracture
37. Arm with an arteriovenous (AV) fistula
38. Arm affected by a cerebro vascular accident
39. Arm affected by lymphoedema or where axillary node clearance has taken place, for example
post mastectomy
PERFORM HAND HYGIENE AND PUT ON GLOVES

40. wash hands with soap and water, and dry with single-use towels;
41. After performing hand hygiene, put on well-fitting, non-sterile gloves (in certain circumstances consider double gloving).

SELECT THE SITE

42. The donor will be positioned safely and comfortably in the chair/couch provided for venepuncture, ensuring that the protective arm is in the correct position to support the donor in the event of fainting or any other adverse event.
43. Place a clean paper or towel under the Donor’s arm.
44. Choosing the correct vein is important. When selecting the appropriate site of vein for venepuncture, it is best practice to begin in the most distal aspect of the vein.

<table>
<thead>
<tr>
<th>Median Cubital Vein in the Antecubital Fossa</th>
<th>Advantages</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Clearly visible and accessible</td>
</tr>
<tr>
<td></td>
<td>• Deep veins with rich blood supply</td>
</tr>
<tr>
<td></td>
<td>• Easy to palpate</td>
</tr>
<tr>
<td></td>
<td>• Well supported by subcutaneous tissue (prevents vein rolling under the needle)</td>
</tr>
<tr>
<td></td>
<td>• Accessible in thin people</td>
</tr>
<tr>
<td>Disadvantages</td>
<td>• Brachial artery and radial nerve in close proximity</td>
</tr>
<tr>
<td></td>
<td>• Difficult to locate in child with increased subcutaneous fat</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cephalic and Basilic Veins in the Forearm</th>
<th>Advantages</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Easy to locate</td>
</tr>
<tr>
<td></td>
<td>• Larger veins</td>
</tr>
<tr>
<td>Disadvantages</td>
<td>• Cannot be used if site is used for arteriovenous fistula</td>
</tr>
<tr>
<td></td>
<td>• Not well supported by subcutaneous tissue (vein can roll from needle)</td>
</tr>
<tr>
<td></td>
<td>• Brachial artery close to both veins</td>
</tr>
<tr>
<td></td>
<td>• Median nerve close to basilic vein</td>
</tr>
<tr>
<td></td>
<td>• Radial nerve close to cephalic vein</td>
</tr>
</tbody>
</table>

45. Locate a vein of a good size that is visible, straight and clear. DO NOT insert the needle where veins are diverting, because this increases the chance of a haematoma.
46. Apply the tourniquet about 4–5 finger widths (5/6cms) above the venepuncture site and tighten slowly. Do not leave on for longer than one minute.
47. Ask the volunteer to open/close fist and keep fist closed or place arm below heart level to encourage venous filling
48. Palpate the site to check for rebound elasticity -press lightly with two fingers and release
49. Choose the appropriate vein and determine the correct size of needle.
DISINFECT THE ENTRY SITE

50. Before taking blood, disinfect the site with 2% chlorhexidine gluconate in 70% isopropyl alcohol swab for 30 seconds, by applying firm but gentle pressure and start from the centre of the venepuncture site and work downward and outwards to cover an area of 5-10 cm.
51. Allow to dry completely (30 seconds).
52. DO NOT touch the cleaned site; in particular, DO NOT place a finger over the vein to guide the shaft of the exposed needle. If the site is touched, repeat the disinfection.

VENEPUNCTURE

53. Anchor the vein by holding the Donor’s arm and placing a thumb BELOW the venepuncture site.
54. Ask the Donor to form a fist so the veins are more prominent.
55. Hold the blood collection set between your thumb and index finger
56. Position the needle-facing bevel upwards
57. Insert the needle, directly above the vein, through the skin (angle 10-30 degrees)
58. When the needle punctures the vein, observe for flashback in the chamber of the blood collection set (butterfly system only). The flashback is not evident when using a tube holder and 21/22 gauge needle (Vacuum method).
59. Decrease the angle between the needle and the skin and advance the needle approx. 1mm.
60. When using the tube holder and needle (Vacuum method), anchor the tube holder securely, using your thumb and index finger
   a. Using your thumb, gently but firmly push the blood collection bottle onto the interior needle and allow the blood collection bottle to fill to the appropriate level.
61. When using the butterfly system, draw a discard bottle first, as air from the blood collection tubing will cause under-filling of the bottle
62. When multiple blood tests are required, ensure the blood tests are taken in the proper order of draw
63. Once sufficient blood has been collected, release tension on the tourniquet BEFORE withdrawing the needle. Some guidelines releasing tension on the tourniquet as soon as blood flow is established, and always before it has been in place for one minute.
64. Withdraw the needle gently activating the needle safety device and simultaneously apply gentle pressure to the site with a sterile gauze. Hold the gauze in place for 30-60 seconds, with the arm extended and raised. Ask the Donor NOT to bend the arm, because doing so causes a haematoma.
65. Place the blood collection set into the sharps box.
66. Discard the blood contaminated gauze in the biohazard bag.
67. Apply plaster – but check in advance if the donor has any allergies to plasters or tape.
68. Remove gloves and place in the biohazard bag
69. Carry out effective hand hygiene
70. Check at intervals during the procedure that the donor is feeling well and not experiencing pain or dizziness. Should the donor feel faint or lose consciousness or in the case of any adverse event, immediately remove the tourniquet and needle (see SOP for adverse events).

LABORATORY SAMPLE TUBES

71. Check the label and forms for accuracy. Apply the label which should be clearly written with the information required (point 14).
CLEAN CONTAMINATED SURFACES AND COMPLETE DONOR PROCEDURE

72. It is the Phlebotomist’s responsibility to ensure that the phlebotomy area is left in an acceptable condition at the end of the event.
73. Discard used items into the appropriate category of waste.
74. Perform hand hygiene again, as described above.
75. Recheck the labels on the tubes.
76. Inform the Donor when the procedure is over.
77. Ask the Donor or donor how they are feeling. Check the insertion site to verify that it is not bleeding.
78. Ask the donor to sit up slowly and ask how they are feeling;
79. Before the donor leaves the donation room, ensure that the person can stand up without dizziness and without a drop in blood pressure.
80. Offer the donor some refreshments.

PREPARE SAMPLES FOR TRANSPORTATION

81. Ensure that collected blood samples are stored and delivered to the laboratory with completed documentation, at the recommended temperature, and in a leak-proof, closed container.
82. If there are multiple tubes, place them in a rack or padded holder to avoid breakage during transportation.
83. Dispose of all items appropriately (see Waste SOP)
84. In the case of a blood spill: use yellow spill kit provided and follow SOP for spills
85. All accidental needlesticks MUST BE REPORTED to the Safety officer or designate as soon as possible after the occurrence..
86. Procedures designed to minimise needle-stick injury MUST be followed. Used needles must not be re-sheathed, but discarded immediately into sharps containers for disposal.
87. Spilt blood must be mopped up immediately and the area disinfected. Disinfectant should be poured on to the area of spillage, paper towels added and the area left for at least ten minutes before mopping up. The areas should again be cleaned thoroughly with disinfectant.
SOP – SAFETY GUIDELINES FOR DISPOSAL OF SHARPS

SOP #: Phle08 Implementation Date: __ / __ / __
Revision #: 00 Approval Authority:

1. **Avoid sharp use**, consider less hazardous alternatives to working with needles/sharps.
2. Ensure adequate space and lighting, remove distractions, and concentrate at all times when using sharps - operate slowly and deliberately.
3. Substitute plastic-ware for glassware whenever possible and routinely inspect glassware.
4. Use the needle/sharp only for the purpose for which it was designed.
5. Use cut-resistant gloves if practicable or heavy rubber gloves or consider double gloving.
6. Segregate sharps from other materials, by placing them on a tray or into an appropriate container. Use protective shields, cases, styrofoam blocks, tube holders, etc.
7. Never re-sheath needles after use; instead place the syringe into a sharps container without either detaching or re-sheathing the needle.
8. Use disposable scalpels to avoid detaching blades and deposit them into a sharps container.
9. Make sure that sharps containers are readily available and within close proximity to where the work is being carried out. Dispose of sharps immediately after use.
10. It is the responsibility of the user to dispose of the sharps that have been used.
11. Never clear areas where sharps may be present without hand protection.
12. Dispose of used sharps only in a sharps bin or container which conforms to British Standard 7320:1990 and is UN type-approved for transport, contact HMF (Ext. 3565) to order.
13. Make sure not to fill the sharps container beyond the fill line marked on the side of the container as used sharps protruding from bins are very dangerous.
14. Used, sealed and labeled sharps containers must be stored in an area which will prevent risk of injury to staff, while awaiting transport to the HMF (Ext. 3565). Research personnel must never discard needles or other sharps, including plastic pipette tips into biohazard bags.

Consider the sharps used in your Lab

<table>
<thead>
<tr>
<th>Consider the sharps used in your Lab</th>
<th>Determine the potential biological agents that sharps could be contaminated with</th>
<th>Consider your controls to minimise the associated risk of using potentially contaminated sharps</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serological pipettes should be used in place of glass pipettes</td>
<td>Plastic inoculation loops/spreaders should be used in place of self-made glass loops</td>
<td>Disposable microtome blades in place of removable blades</td>
</tr>
<tr>
<td>Disposable scalpels or the QlickSmart system in place of removable blades, also consider Retractable Safety Scalpels</td>
<td></td>
<td>Safety needle in place of standard needle. E.g. BD Safety Syringes or VanishPoint or Point-Lok Device</td>
</tr>
<tr>
<td>Holder for backed razor blades instead of loose blades</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Serological pipettes should be used in place of glass pipettes

Plastic inoculation loops/spreaders should be used in place of self-made glass loops

Disposable microtome blades in place of removable blades

Safety needle in place of standard needle. E.g. BD Safety Syringes or VanishPoint or Point-Lok Device
SOP – TRANSPORT WITHIN BUILDING

SOP #: Phle09

Implementation Date: __ / __ / __

Revision #: 00

Approval Authority:

➤ Care must be taken when handling samples to ensure that they are transported as quickly and as safely as possible, and that the risk of infection is kept to a minimum at all times.

Primary sample containers must never be carried unprotected in the open hand or given to other members of staff in this way.

Ensure the primary container is leak-proof and secured with a tight-fitting cap (o-ring), parafilm, or lab tape. Label appropriately.

The sample must then be sealed in a secondary container and swabbed with an appropriate disinfectant. The secondary container should have a general description of all material stored inside coupled with contact details.

No simple solution; due to the variety of tubes and containers, consider lab based or commercially designed solutions

Nalgene BioTransport Carrier

Nalgene Laptop-Cooler

BioPack-2airsea

Multiple primary containers may be placed in a single secondary container but must be separated absorbent material to prevent contact between them.

For movement between labs use a cart or other device if appropriate

If blue ice is used, it must be placed between the secondary container(s) and an outer transport container. Replicate labelling on outer package.

DO NOT wear a lab-coat in public areas or gloves including the ‘one glove method’ for transporting containers between labs, the double or triple packaging outlined above must be sufficient to mitigates any contamination risks.

➤ Samples must never be left unattended in a public area.
➤ Do not walk through food and beverage consumption areas. Avoid carpeted areas.
➤ Upon reaching destination, don gloves & store samples appropriately.
➤ Note: Contact the Hazardous Materials Facility (Ext. 3565) for details on transporting specimens to collaborators within and outside College.
Before starting work:

- Wash hands and arms before and after work.
- Put on protective clothing; double gloves, lab-coat, protective eyewear.
- Ensure that the laboratory door is closed and only authorised users are present.
- Discourage the movement of other workers around the BSC to insure the integrity of the cabinet airflows.
- Turn off the UV lights (if it is being used) upon entering the work area.
- Turn on the blower.
- Ensure the sash window is in the work standard position (opened 200mm).
- After 3mins of ‘STAND-BY’, the BSC is ready to be disinfected. Disinfect surfaces with an appropriate disinfectant (70% IMS).
- Leave the cabinet for 20 minutes before starting any work. Swab everything you will need to carry out work into the BSC with an appropriate disinfectant (70% IMS).
- Ensure freshly prepared disinfectant and a spill kit are readily available to deal with any spills that may occur.
- Ensure an appropriate waste disposal bin is located within the BSC for safe disposal of waste.
- If the buzzer sounds at any point during operation and the display advises of an airflow alarm, then the cabinet should not be used, contact the Safety Officer.
When working:

Minimise the amount of materials within the cabinet, so as not to disrupt airflows.

With respect to open fronted cabinets, work as near to centre of cabinet, but at least 15cm from front.

For Class II cabinets never obstruct air in-flow grilles or exhaust grills, e.g. with notebooks or paper as this will adversely affect containment.

Do not make rapid arm movements, if removing your arms from the BSC do so by drawing your arms backwards in a slow manner, never to the side, so as to minimise disruption of the air flow curtain.

Do not mix sterile with infected materials, separate clean and contaminated items and avoid passing infected material over clean material.

Dispose of contaminated material into appropriate biohazard containers within the cabinet.

If there is a power failure, make work secure (e.g. put lids on flasks etc) and close cabinet front and leave the lab immediately.

Do not use a flame, turbulence and filter damage may occur.

Sterile  ----> Dirty

Completion of work:

Swab materials with an appropriate disinfectant. Leave for an appropriate time period before removing from the BSC.

Similarly swab the waste container from cabinet and dispose of appropriately, refer to waste SOP.

Wipe all surfaces with disinfectant (70% IMS).

Turn off the light by pushing the light key

Press “I/0” key switch.

Slide the sash window completely down and switch on the germicide lamp by pushing the “U.V.”.

Remove protective clothing, wash hands and arms and exit the facility.
## SOP – CENTRIFUGE SAFETY

**SOP #: Phle11**

**Implementation Date:** __ / __ / __

**Revision #:**

**Approval Authority:**

### GENERAL

1. Only suitably trained persons may operate a centrifuge.
2. Never exceed the maximum stated speed for any rotor.
3. Never attempt to override the interlocks, or open the lid of a centrifuge, or slow the rotor by hand, or open the lid while rotor is in motion as serious injuries may occur in all cases.
4. Make sure each tube compartment and the rotor itself is clean and corrosion free.
5. Check centrifuge chamber, drive spindle and tapered mounting surface of the rotor are clean and free of scratches.
6. Wipe drive surfaces prior to installing the rotor.
7. If the temperature of the chamber is below room temperature, pre-cool the rotor to the lower temperature before securing the rotor (this will minimise the chance of it seizing to the tapered spindle).
8. Check compatibility of tube material to solvent medium (some solvents may cause the tubes to swell or crack in the rotor).
9. Use appropriate centrifuge compatible tubes.
10. Avoid the use of celluloid (cellulose nitrate) tubes with biohazardous materials. Celluloid centrifuge tubes are highly flammable and prone to shrinkage with age.
11. High-speed centrifuges pose additional hazards. Manufacturers’ recommendations must be meticulously followed to avoid metal fatigue, distortion and corrosion.

### OPERATION

- **Use sealed tubes and bio-seal buckets/rotors. Inspect tubes, O-rings and buckets/rotors for cracks, chips, erosions, broken glass, etc.**
- **Swab centrifuge tubes, buckets/rotors with an appropriate disinfectant into a BSC. Do not fill tubes beyond – 3/4 full.**
- **After tubes are filled and sealed, wipe them down with disinfectant and leave for an appropriate time.**
- **Rotor/bucket loads should be balanced in pairs, and evenly distributed around the rotor.**
- **Secure the lid(s) and seals of the rotor/buckets, and swab with an appropriate disinfectant and leave for an appropriate time period before removing from the BSC to the centrifuge (use a cart or trolley where appropriate).**
- **Make sure that any rotor lid securing device and any rotor to spindle securing device is fully secured before starting the machine.**
- **After the run has been completed, swab the rotor/buckets back into the BSC and open the centrifuge tubes towards the back of the BSC with the tubes pointed away from the operator.**
- **Work in a BSC when resuspending sedimented material. Use a swirling rotary motion rather than shaking. If shaking is necessary, wait a few minutes to permit the aerosol to settle before opening the tube.**
SOP – LAB BIOSECURITY

SOP #: Phle12  Implementation Date: __/__/__

Revision #:  Approval Authority:

General Security Measures:
- Laboratory access should be restricted to those with a need; the leading lab PI is responsible to determine who will be granted access rights.
- Keep laboratory doors closed. This protects experiments from contamination and discourages individuals from wandering into the room. Lock the doors when the room is unoccupied.
- Keep stocks of organisms locked out-of-hours and when the laboratory is unoccupied (e.g. lunch).
- Do not leave keys or access cards in open or accessible areas. Do not disclose access codes or loan keys to other personnel. Limit the number of persons with access rights to a minimum.
- Ask strangers such to exit the laboratory if they are not authorised to be there.
  - a) ask them if they need assistance;
  - b) politely ask them to leave the area;
  - c) ask them to follow you to the school office to seek further information, and lock the door before leaving.
- When research is completed for the day, ensure that all biological materials have been properly stored and secured. Lock all laboratory doors.
- Consult the out-of-hours policy - your local Safety Officer will be able to provide guidance.
## SOP – CONSUMABLE ORDERING

**SOP #: Phle13**

**Implementation Date:** __ / __ / __

**Revision #:**

**Approval Authority:**

<table>
<thead>
<tr>
<th>Description</th>
<th>Catalogue No.</th>
<th>Supplier</th>
<th>Account No.</th>
<th>Contact No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>9ml EDTA tubes (pack of 1)</td>
<td></td>
<td>Cruinn Diagnostics</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sarstedt Ltd.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>BD</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
SOP – PROCESSING BLOODS

SOP #: Phle14

Receipt of Blood samples:

- Blood samples should be transported in ice or at room temperature for short periods.
- All refrigerators and freezers used for samples must have controlled access. A logbook for each refrigerator and freezer shall be maintained including details, sample traffic and periodic temperature checks.
- When the samples are stored, the inventory must be updated accordingly.
- Conduct an inventory audit periodically to track and account for any missing/misplaced samples. Discuss any discrepancies with the lab supervisor and other researchers. Report losses to appropriate personnel.
- Out-going packages must be prepared in accordance with transport regulations aided by advice from the Hazardous Materials Facility (Ext. 3565; email: hazmat@tcd.ie)
- If the sample container integrity is compromised – refer to the spill response SOP, alert appropriate personnel, and document the destruction of the sample. Alternatively, follow sample recovery protocol if instructed:
  1) Place container on a containment tray and take to a safety cabinet.
  2) Remove lid or cap and transfer the remaining part of the specimen to another container.
  3) Replace cap and place soiled container in a biohazard bag and leave it on the tray.
  4) When dealing with contaminated forms/paperwork
     i. Wear disposable gloves
     ii. Dictate information on form to colleague who will complete a new form
     iii. Discard the contaminated paper into an infected waste container
  5) Transfer biohazard bags containing the broken/leaking container and form into an appropriate container for disposal and disinfect the tray.
  6) Finally, disinfect or sterilise the tray or container in which the affected specimen(s) arrived in the laboratory.

Processing Bloods:

- Commence by washing hands as guided by SOP #: Phle04, and frequently during the course of your daily work, always before a break, at the end of the day and immediately if they become, or suspect they have become, contaminated by a sample.
- When working in the laboratory the researcher must wear protective clothing when processing bloods to include at a minimum: lab coat, gloves and protective eye wear (see SOP #: Phle04).
- Keep laboratory doors closed. This protects experiments from contamination and discourages individuals from wandering into the room and resultant mix-ups that may arise from lack of attention. Lock the doors when the room is unoccupied.
- Keep blood collection tubes locked out-of-hours and when the laboratory is unoccupied (e.g. lunch). Such samples must be stored in refrigerators and freezers, separate from standard reagents.
All work should be planned in a manner that minimises splashing, spraying and aerosolisation of blood samples. Use a Biological Safety Cabinet where appropriate.

Where possible, process samples in batches. This reduces the time spent handling human material.

To minimise risk in the event of spillage or breakage do not store sharps in designated handling areas.

Inspect the sample prior to processing, verifying that the correct item was received and that the information on the sample is correct.

Transfer the blood sample tubes to the centrifuge using a sealable secondary container and a trolley where appropriate, thereby, minimising the potential for breakage.

When the whole blood has been spun in the centrifuge (refer to SOP – centrifuge safety)

Ensure the collection tubes for the serum plasma are labelled correctly and are placed in the rack ready for aliquoting within the Biological Safety Cabinet.

Within the Biological Safety Cabinet, the researcher must carefully unscrew the top off the separated blood tube ensuring that it is not tipped, thereby, avoiding the potential for remixing.

Pipette out the serum plasma from the blood cells into the labelled collection tube. The blood tubes can be tilted slightly to make pipetting easier.

Ensure that the cap or lid or the tube is securely closed to avoid any leakage or spillage.

The whole blood tube and pipette must then be discarded in an appropriate biohazard waste container and chemically inactivated (see waste SOP).

Remove gloves and dispose of them in a biohazard waste bin.

After the samples have been processed the laboratory work surface should be decontaminated using the appropriate cleaning products (see cleaning SOP).

Coats and gowns should be removed before leaving the laboratory.

**Storage**

Samples may be stored at -20°C for a few weeks or -80°C for months. Freezing and thawing should be avoided.

Ensure that the samples are adequately labelled with the following information;

- Date,
- Sample ID,
- Sample type,
- Investigator contact name/number.

Samples must be placed in secure leak proof freezer compatible secondary containers (labelled as “containing biohazardous material” and with a specific container number).

Remove the samples within the secondary container to -80°C freezer using a trolley (where necessary)

All refrigerators and freezers used for samples must have controlled access. A logbook for each refrigerator and freezer shall be maintained including details, sample traffic and periodic temperature checks.

Place the labelled samples on the allocated shelf within the freezer compartment

When the samples are stored, the inventory must be updated accordingly.

Close the inner compartment door and the main freezer door ensuring that it is closed and locked – wash hands.
SOP – CLEANING

SOP #: Phle15  Implementation Date: __ / __ / __
Revision #:  Approval Authority:

Equipment Cleaning

If contaminated internal parts of equipment which cannot be decontaminated by swabbing, then disinfection must be performed by one of the following methods, as appropriate:

- If water-resistant, immerse apparatus completely in appropriate disinfectant (e.g. pipette parts, etc);
- For heat resistant equipment, autoclaving may be suitable;
- Sensitive pieces of equipment that cannot be autoclaved or immersed in liquid, should be decontaminated with hydrogen peroxide inside a containment cabinet (Contact: local Safety Officer for further details).

All equipment must be effectively decontaminated before being serviced.

General Laboratory Cleaning:

- The laboratories should be cleaned by the laboratory staff.
- All surfaces and equipment within the laboratory that facilitate manipulation of infectious material should be regarded as potentially infectious and should be cleaned on a daily basis with an effective disinfectant (e.g. Virkon 1% conc.) followed by 70% IMS. Surfaces of equipment including the Biological Safety Cabinet should be wiped with (Virkon 1% conc. followed by 70% IMS).
- Floors should not be swept, but should be mopped weekly with a detergent solution.
  - Ideally, the mop heads should be disposable and autoclaved after use.
- Floors and work surfaces should be kept as free of clutter as possible. Materials should be stored in closed cupboards where possible. Excess reagents should be boxed, labelled and stored in the store room.
- Check spill kit contents on a monthly basis.

Cleaning:

- Prepare sufficient fresh disinfectant/cleaning solutions
- Wear appropriate PPE.
- Remove all items from the floor that may inhibit thorough cleaning of the entire surface.
- Mop the floor with a detergent solution.
- Clean outer surfaces of cupboards, trolleys, sinks and chairs with a detergent solution followed by an effective disinfectant on a weekly basis
- Clean all racks for specimens and tubes on a weekly basis by immersion in (Virkon 1%) followed by allowing such items to air-dry.
**Phlebotomy Room Requirements:**

- The door to the Phlebotomy Room must be self-closing and lockable.
- Floor - vinyl/ sealed / coved / epoxy / flooring
- A good air change rate within the room would be desirable
- A hand-washing sink ((knee/elbow operated) must be located near the point of exit from the room.
- Soap dispensers in good working order
- Antiseptic handwash liquid available
- Alcohol hand run available at station
- Paper towel dispenser in good working order
- Biohazard receptacles for waste, biohazard waste and sharps must be present.
- Lockable cabinet for supply's
- A plinth, which is accessible from either the right or the left, is present with cushions available to raise legs to cater for individuals who faint.
- Biohazard spill kits are present
- Hand hygiene poster at sink
- First Aid kit
- Emergency contact list posted

**Phlebotomy Room cleaning:**

- Equipment should be wiped down with a mild detergent solution weekly, or more often as needed.
- The plinth should be inspected carefully for tears at least monthly. To prevent contamination, tears must be repaired before further specimen collection is carried out.
- Countertops and work surfaces should be wiped down with a clean cloth and a disinfecting agent after human specimens have been handled.
- The phlebotomist is responsible for having biohazard waste including sharps containers removed at the end of the work period/day.
- Floors should not be swept, but should be mopped weekly with a detergent solution.
- Ideally, the mop heads should be disposable and autoclaved after use.
- Floors and work surfaces should be kept as free of clutter as possible. Materials should be stored in lockable cupboards where possible.

Refer to the following:

- WHO guidelines on drawing blood: best practices in phlebotomy;
- Infection control in the built environment;
- A Strategy for the Control of Antimicrobial Resistance in Ireland;
- Phlebotomists Association of Ireland Ltd: PHLEBOTOMY GUIDELINES (see sink audit tool below).

**Disinfectants:**

Consult the manufacturer directions to determine the efficacy of the disinfectant against the Biohazards in your lab and be sure to allow for sufficient contact time. Refer to the following:
# Use of Chlorine Disinfectant

## Before you start:
- Wear appropriate Personal Protective Equipment (PPE)
- Ensure good ventilation when using chlorine products
- Always make-up a freshly prepared dilution.
- Refer to the SDS and risk assessment before use
- Check expiry date

### Highly effective against:
- Vegetative bacteria
- Viruses
- Fungi

### Limited activity against:
- Bacterial Spores

## Small Biological Agent Spill Response

- Restrict Access
- Retrieve Spill kit
- Wear PPE & double glove
- Absorb with NaDCC Granules
- Collect spill mixture after 10min
- Dispose of granules in yellow bin
- Wash area with mild detergent
- Autoclave contaminated materials

## Large Biological Agent Spill Response

- Leave area for 30 mins
- Retrieve Spill kit
- Wear PPE & double glove
- Cover with absorbent towels & Apply 10,000ppm chlorine disinfectant solution to the towels. Leave 30min
- Wash area with mild detergent
- Autoclave contaminated materials

### Notes:
- Hypochlorite solutions must never be mixed with hot water
- Hypochlorite must not be mixed with acids or urine as chlorine gas is released at low pH
- Should not be mixed with formaldehyde as bis chloromethyl 3 ether (a lung carcinogen) is released
- Inactivated by organic matter (concentration may need to be increased)
- Corrosive to metals and can damage rubber
- Stock solutions decay with time, light and temperature

## Working dilutions are:
- 1000ppm - general cleaning of equipment and benches
- 2500ppm - discard jars
- 10,000ppm – spillages

<table>
<thead>
<tr>
<th>PresSept Tablets (NaDCC)</th>
<th>PresSept Granules (NaDCC)</th>
<th>Haz-Tab (NaDCC)</th>
<th>Haz Tab Granules (NaDCC)</th>
<th>Hypochlorite (NaOCl)</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="PresSept Tablets" /></td>
<td><img src="image2" alt="PresSept Granules" /></td>
<td><img src="image3" alt="Haz-Tab" /></td>
<td><img src="image4" alt="Haz Tab Granules" /></td>
<td><img src="image5" alt="Hypochlorite" /></td>
</tr>
</tbody>
</table>
# Use of Peroxygen (Virkon) Disinfectant

**Before you start:**
- Wear appropriate Personal Protective Equipment (PPE)

**Always make-up a freshly prepared dilution.**
- Refer to the SDS and risk assessment before use
- Check expiry date

### Effective against:
- Bacteria, Viruses and Fungi

### Variable activity against:
- Bacterial Spores or Mycobacterium spp.

## Small Biological Agent Spill Response

<table>
<thead>
<tr>
<th>Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>Restrict Access</td>
</tr>
<tr>
<td>Retrieve Spill kit</td>
</tr>
<tr>
<td>Wear PPE &amp; double glove</td>
</tr>
<tr>
<td>Absorb with Virkon/NaDCC Granules</td>
</tr>
<tr>
<td>Collect spill mixture after 10 min</td>
</tr>
<tr>
<td>Dispose of granules in yellow bin</td>
</tr>
<tr>
<td>Wash area with mild detergent</td>
</tr>
<tr>
<td>Autoclave contaminated materials</td>
</tr>
</tbody>
</table>

## Large Biological Agent Spill Response

<table>
<thead>
<tr>
<th>Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leave area for 30 mins</td>
</tr>
<tr>
<td>Retrieve Spill kit</td>
</tr>
<tr>
<td>Wear PPE &amp; double glove</td>
</tr>
<tr>
<td>Cover with absorbent towels &amp; Apply 1% Virkon disinfectant solution to the towels. Leave 30min</td>
</tr>
<tr>
<td>Wash area with mild detergent</td>
</tr>
<tr>
<td>Autoclave contaminated materials</td>
</tr>
</tbody>
</table>

## Notes:
- Powder form is an irritant, a fume cupboard should be used if preparing solutions from powder.
- Built-in colour indicator: Can be stable for up to 7 days when dilute (environment dependent)
- Can be ineffective at high concentrations (>4%)
- Less corrosive than hypochlorite but still may cause corrosion
- Virkon can generate sulphur dioxide when heated in an autoclave. Autoclaving should be avoided or only undertaken in an autoclave that is connected to the mains water supply and that is also an externally exhausted system.

## Working dilutions are:

<table>
<thead>
<tr>
<th>Area</th>
<th>Solution</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Benches, floors etc.</strong></td>
<td>1% Virkon</td>
<td>1 hour</td>
</tr>
<tr>
<td><strong>Metal parts</strong></td>
<td>1% Virkon</td>
<td>1 hour</td>
</tr>
<tr>
<td><strong>Safety cabinets</strong></td>
<td>1% Virkon, followed by 70% alcohol</td>
<td>10 mins**</td>
</tr>
<tr>
<td><strong>Discard jars</strong></td>
<td>1% Virkon</td>
<td>1 hour</td>
</tr>
<tr>
<td><strong>Supernatants:</strong></td>
<td>2% Virkon</td>
<td>1 hour</td>
</tr>
<tr>
<td><strong>For CL1 bacteria in culture broth:</strong></td>
<td>3% Virkon</td>
<td>1 hour</td>
</tr>
<tr>
<td><strong>For CL1 tissue culture medium or other buffered system:</strong></td>
<td>3% Virkon</td>
<td>1 hour</td>
</tr>
<tr>
<td><strong>Spillages:</strong></td>
<td>Virkon powder directly onto spill, Swab area with 1% solution</td>
<td>Until liquid absorbed</td>
</tr>
<tr>
<td><strong>Contaminated clothing</strong></td>
<td>Where autoclaving is not possible/appropriate soak in 1% Virkon. [test small area for colour fastness]</td>
<td>1 hour</td>
</tr>
</tbody>
</table>
**Use of Alcohol Disinfectant**

**Before you start:**

- Wear appropriate Personal Protective Equipment (PPE)
- Always make-up a freshly prepared dilution.
- Refer to the SDS and risk assessment before use
- Check expiry date

- Active against many bacteria and fungi but not bacterial spores
- Ethanol has variable anti-viral activity (particularly against non-enveloped viruses)
- Isopropanol is not effective against most categories of virus

<table>
<thead>
<tr>
<th>Small Biological Agent Spill Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Restrict Access</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Large Biological Agent Spill Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leave area for 30 mins</td>
</tr>
</tbody>
</table>

**Notes:**

- Poor penetration of organic matter
- Should be used only on physically clean surfaces
- Flammable and should not be used near flames or electrical equipment that is likely to generate sparks (e.g. domestic type refrigerators)
- Can be used as a surface disinfectant for metal parts and surfaces where the use of Virkon may not be possible. (E.g. centrifuge parts and internal surfaces of MSCs).

**Working dilutions are:**

<table>
<thead>
<tr>
<th>Disinfectant</th>
<th>Concentration</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethanol (including Industrial Methylated Spirits)</td>
<td>70%</td>
<td>Rapid action</td>
</tr>
<tr>
<td>Isopropanol</td>
<td>60-70%</td>
<td>Rapid action</td>
</tr>
<tr>
<td>Methanol</td>
<td>Methyl alcohol (methanol) has the weakest bactericidal action of the alcohols and should not be used.</td>
<td></td>
</tr>
</tbody>
</table>
## Waste Disposal Container

<table>
<thead>
<tr>
<th>Clear Bin Bags</th>
<th>Typical Contents</th>
<th>Treatment</th>
</tr>
</thead>
</table>
|                | ✓ Cardboard / Paper packaging  
|                | ✓ Packaging from laboratory consumables  
|                | ✓ Uncontaminated paper towels / tissues  
|                | ✓ Non hazardous plastic chemical containers (rinsed out and labels removed)  | Collected by Housekeeping for disposal  
|                | ✓ Do not overfill - ⅔ full for bags, & ¾ full for bins  
|                | ✓ Recycle paper and card  |

<table>
<thead>
<tr>
<th>Yellow Biohazard Bags &amp; Black cable tie. Supported &amp; protected in suitable holder</th>
<th>Typical Contents</th>
<th>Treatment</th>
</tr>
</thead>
</table>
| Yellow Rigid Bin (60L) lined with Yellow Biohazard Bags                                | ✓ Soft biohazard material  
|                                                                                   | ✓ Gloves  
|                                                                                   | ✓ Cotton wool swabs  
|                                                                                   | ✓ Surface wipe-down swabs  | Transfer to HMF for final disposal.  
|                                                                                   | ✓ Secure the lid  
|                                                                                   | ✓ Contact Lab Manager to arrange disposal via SRCL  |

<table>
<thead>
<tr>
<th>Sharps Bins</th>
<th>Typical Contents</th>
<th>Treatment</th>
</tr>
</thead>
</table>
|             | ✓ Sharps e.g.  
|             | ✓ Needles + syringes | Transfer to HMF for final disposal.  
|             | ✓ Secure the lid  
|             | ✓ Contact Lab Manager to arrange disposal via SRCL  |

<table>
<thead>
<tr>
<th>Liquid Waste</th>
<th>Typical Contents</th>
<th>Treatment</th>
</tr>
</thead>
</table>
|              | ✓ Blood | Liquid waste must be placed in a closed leak-proof container within the BSC – add one 2.5g tablet of Presept for every 560ml of waste (2500ppm).  
|              |                         | Leave overnight & then dispose of disinfected contents down the sink.  
|              |                         | Alternatively, autoclave at 121°C for a holding time of 15-20mins. Never autoclave liquid waste that has been pre-treated with virkon or chlorine.  |