

Standard Operating Procedure Pipettes and Pipet Controllers	
SOP Number: <u>SOP-PPC-02</u>	Category: <u>Lab Equipment</u>
Supersedes: <u>SOP-P-01</u>	Original Date: <u>December 1, 2017</u>
	Revised: <u>May 1, 2019</u>
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Issued by: Director, Health Sciences Research	

1.0 POLICY

This standard operating procedure (SOP) describes the proper pipetting technique to reduce the generation of aerosols while working in the W.J. Henderson Centre for Patient-Oriented Research (WJHCPOR).

2.0 PURPOSE

To ensure that all users of the WJHCPOR can safely use the pipettes and pipet controllers to manipulate potentially infectious biospecimens and reduce the risk of infection.

3.0 DEFINITIONS

Aspirate - to draw liquid up into the pipette tip.

Blow Out - the piston moves to the lowest position in order to blow out the residual liquid from the pipette tip. During pipetting operations, the liquid from the blow out is part of the dispensing volume.

Dispense - to discharge the liquid from the tip.

4.0 RESPONSIBILITY

Users are responsible for:

- Attending orientation and training on the use of pipettes and pipet controllers prior to use.
- Taking proper care of the pipettes and pipet controllers according to specified use guidelines as set out by this SOP and the manufacturer.
- Reading and following all instructions for usage and maintenance of the pipettes and pipet controllers.

- Selecting the appropriate pipette, pipet controller, and disposable tips for the research protocol in use.

NOTE: IF AT ANY TIME YOU ARE UNSURE HOW TO USE THE PIPETTES OR PIPET CONTROLLERS SAFELY, PLEASE REFER TO THE INSTRUCTION MANUAL FOR FURTHER DETAILS AND/OR ASK THE DESIGNATED KGHRI STAFF MEMBER FOR ASSISTANCE.

- Reporting any damage to the pipettes and pipet controllers to the designated KGHRI staff member immediately so repairs can be made.
- Wearing appropriate PPE (lab coat, safety glasses, and gloves) when using the pipettes and pipet controllers.
- **ALWAYS** pipetting in the biological safety cabinet (BSC).
- **ALWAYS** disposing of the pipette tips (or disposable pipettes) in the appropriate biological waste container.
- **ALWAYS** wiping down the pipettes and pipet controllers with an Oxivir®/Accel® INTERVention wipe after use.

KGHRI is responsible for:

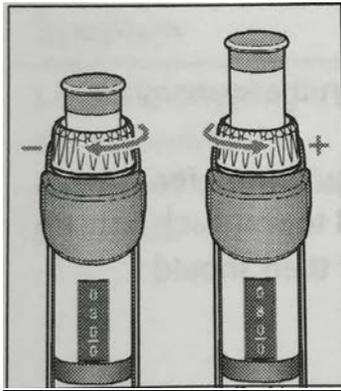
- Training new users in safe usage of the pipettes and pipet controllers, documenting the training of all users, and ensuring users are proficient in performing the steps of this SOP.
- Ensuring all copies of user instructions for the pipettes and pipet controllers are readily available to all users.
- Ensuring all pipettes and pipet controllers used are in good repair, calibrated and decontaminated prior to repair/calibration.
- Ensuring that all the regular and periodic maintenance required is carried out and recorded in the **Maintenance Log**.
- Ensuring the records of repair is kept and available for inspection.
- Providing Oxivir®/Accel® INTERVention wipes for users of the WJHCPOR.

5.0 PROCEDURES

5.1 Using the Pipettes

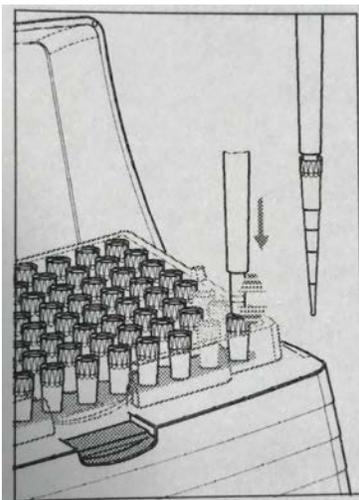
5.1.1 Setting the Volume using the Pipettes

Turn the volume adjustment ring as depicted in the image below to adjust the volume. The height of the control button changes as the volume is adjusted. The numbers on the volume display are to be read from the top to the bottom. The decimal places are below the hyphen. The volume is displayed in μL . The **BLUE** pipette volumes are 100 to 1000 μL . The **YELLOW** pipette volumes are 10 to 100 μL . Adjust the volume setting from a higher value to a lower value. If required, turn beyond the required value and then back again.

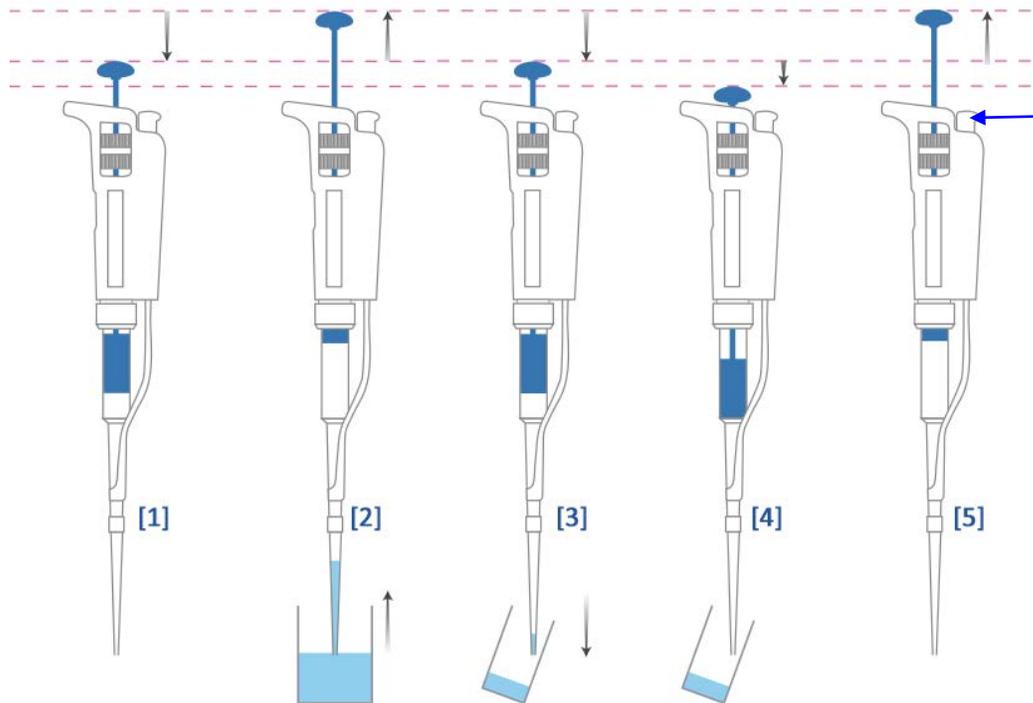


5.1.2 Using Pipette Tips

The pipette is only functional if a disposable pipette tip is attached. The colour of the control button matches the colour of the epTIPS tray (blue or yellow) that you need. Fit the suitable pipette tip on the tip cone, applying light pressure (see image below).



5.1.3 Aspirating Liquid with the Pipettes



Step 1: Press down the control button to the 1st stop

Step 2: Always aspirate sample in the vertical position (approximately 4 mm into the liquid). To aspirate the liquid, allow the control button to slide back slowly. Maintain the immersion depth, so that no air is aspirated accidentally. In the case of large volumes: before removing the pipette tip from the liquid, wait approximately 3 seconds. To ensure maximum precision and accuracy, wet each new tip initially by aspirating and dispensing the liquid one to three times. Only then should pipetting commence. Remove the tip slowly from the liquid. Wipe the tip slowly against the tube wall to ensure that no outer wetting remains on the tip.

Step 3: Place the tip on the tube/cryovial wall at an angle. Press the control button slowly until the first stop and wait until the flow of liquid stops.

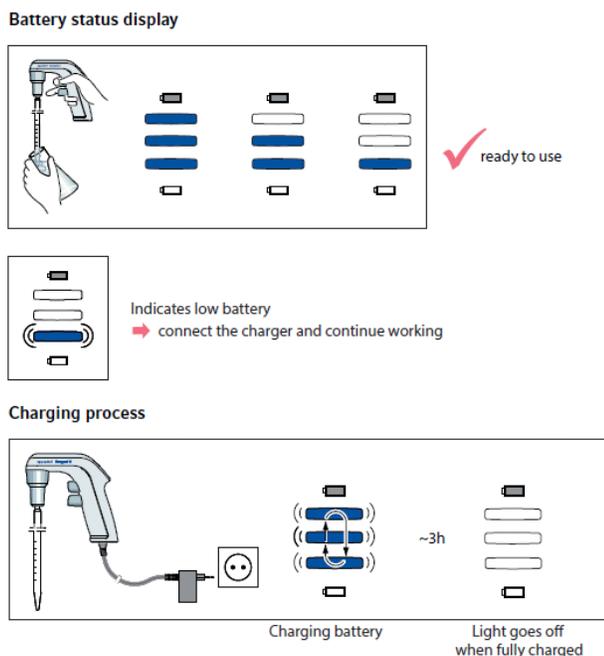
Step 4: Pause, and then press the control button until the 2nd stop to eject (blow out) remaining liquid.

Step 5: To eject the tip, press the tip ejector mechanism. Eject tip carefully into the proper biological waste container. A new disposable tip should be used between each specimen tube to prevent contamination.

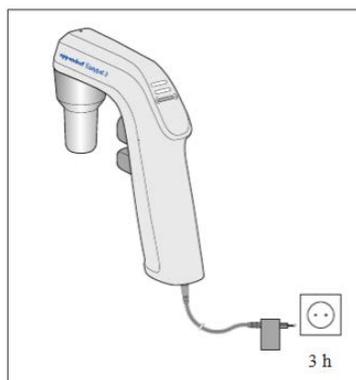
5.2 Using the Pipet Controllers

5.2.1 Checking the Battery Status and Charging the Pipet Controllers

The rechargeable battery status will be displayed during operation of the pipet controllers. When the status display is blinking, the rechargeable battery needs to be charged (see image below).

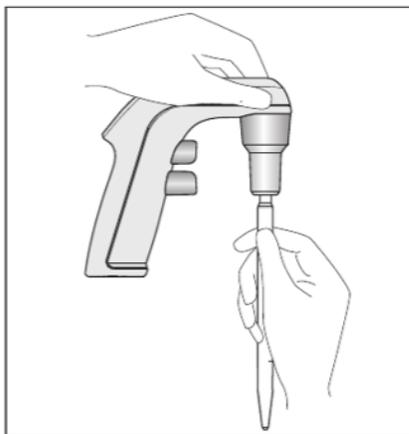


To charge the pipet controller, insert the charging plug on the power supply device into the connector socket located on the grip of the pipet controller. Insert the power supply device into the electrical wall power outlet to begin charging the rechargeable battery (see image below). The charging time depends on the charging state of the rechargeable battery. When fully depleted, the rechargeable battery can take up to three (3) hours to fully charge. The pipet controllers **MUST** not be used while charging is occurring. Users **MUST** use the designed pipet controller charging stations to charge the pipet controllers in between use when the rechargeable battery needs to be charged.



5.2.2 Inserting the Disposable Serological Pipette onto the Pipet Controller

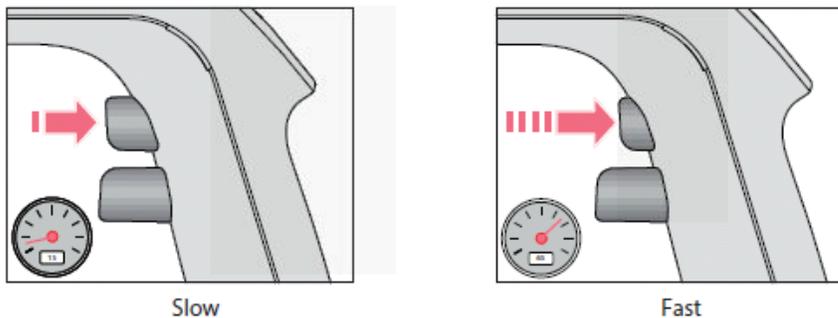
Grasp the disposable serological pipette (10 mL and 25 mL made available to users) near the top and insert carefully into the aspirating cone of the pipet controller until it is positioned securely and airtight (see image below). It is best to leave on the packaging of the disposable serological pipette during this process until the user is ready for first time use. **DO NOT** force the disposable serological pipette to go into the pipet controller. Ensure you are wearing your personal protective equipment (PPE) during this step.



5.2.3 Adjusting the Speed Control on the Pipet Controller

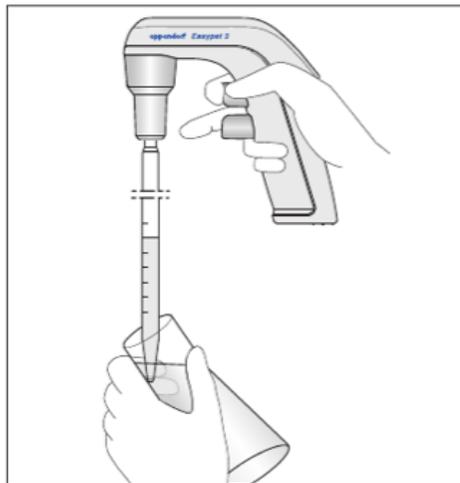
The speed at which liquid is aspirated into the disposable serological pipette or dispensed out of the disposable serological pipette is regulated continuously by controlling how far the control button is pressed. No speed setting is necessary. The top control button controls aspiration of the liquid and the bottom control button controls dispensing the liquid. To slowly aspirate or dispense liquid press the appropriate control button lightly. To quickly aspirate or dispense liquid, press the appropriate control button firmly. The more pressure on the control button the faster the speed of the pipet controller (see image below).

Speed control

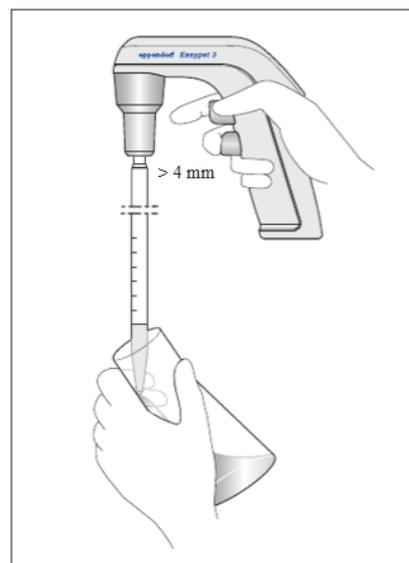
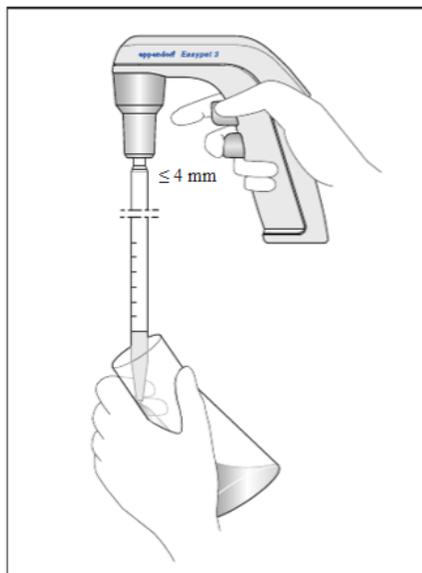


5.2.4 Aspirating and Dispensing using the Pipet Controller

Immerse the tip of the disposable serological pipette into the liquid. Begin by slowly pressing the aspirating control button and keep it pressed down. The further the aspirating control button is pressed, the quicker the liquid will be aspirated. For smaller volumes of liquid, applying light pressure to the control button will help to slow down the aspiration speed to avoid overshooting and splashing. Wipe the disposable serological pipette on the tube inner wall prior to removal.

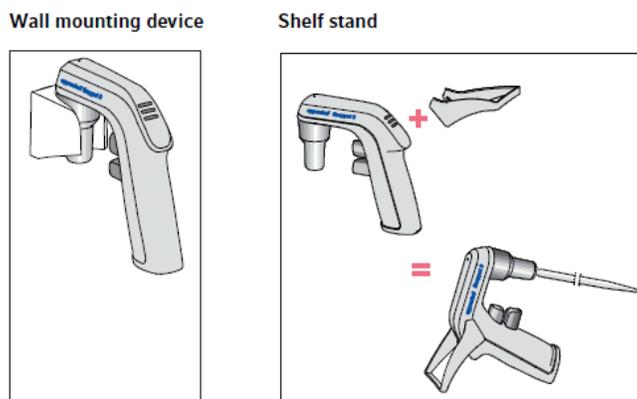


To dispense the liquid, hold the disposable serological pipette vertically and place it on the tube inner wall. Begin by pressing the dispensing control button to allow the liquid to flow (slow dispensing) or blow (fast dispensing) out. During the blow-out the liquid will be dispensed using the pump. When complete, discard the disposable serological pipette into the yellow coloured waste bin/container.



5.2.5 Storing the Pipet Controllers

The pipet controllers can be stored by using the wall-mounting device or shelf stand.



5.2.6 Cleaning the Pipet Controllers

The outside of the pipet controllers **MUST** be wiped down using Oxivir®/Accel® INTERVention wipes after each use. The pipette clamp unit **does not** have to be disassembled after each use **unless** any liquid enters the pipette clamp unit.

If liquid has entered the pipette clamp unit, the user must disassemble the pipette clamp unit and clean or toss out the contaminated parts as described below. Users need to document in the log binder located in the Research Centrifuge Room all incidents when the pipette clamp unit is contaminated and cleaned by users.

To disassemble the pipette clamp unit (users **MUST** be wearing gloves during this step):

- Unscrew the aspirating cone by turning counterclockwise to remove it from the pipet controller. Wipe down the aspirating cone using Oxivir®/Accel® INTERVention wipes. Place aside on a paper towel to dry off.
- Pull out the silicone pipette adaptor and the membrane filter from the aspirating cone. Pull out the membrane filter from the silicone pipette adaptor.
 - The membrane filter needs to be placed into the yellow coloured waste bin/container and a new sterile membrane filter needs to be used when the pipette clamp unit is put back together after cleaning.
 - The silicone pipette adaptor is to be rinsed with demineralized (distilled) water. Place aside on a paper towel to dry off. Demineralized (distilled) water that can be found in the cabinet under the centrifuges.

- Using tweezers, pry out the seal out of the filter adaptor on the pipet controller. The seal is to be rinsed with demineralized (distilled) water. Place aside on a paper towel to dry off. Demineralized (distilled) water that can be found in the cabinet under the centrifuges.

<p>Aspirating cone</p> 	<ul style="list-style-type: none"> Can be wiped using a damp cloth Can be disinfected with alcohol (ethanol, propanol) or alcohol-containing disinfectants Repeatedly autoclavable Can be replaced
<p>Pipette adaptor</p> 	<ul style="list-style-type: none"> Can be rinsed with demineralized water Repeatedly autoclavable Can be replaced
<p>Membrane filter</p> 	<ul style="list-style-type: none"> To be dispose of if contaminated Cannot be cleaned Can be autoclaved once Can be replaced
<p>Sealing</p> 	<ul style="list-style-type: none"> Can be rinsed with demineralized water Repeatedly autoclavable Can be replaced

- Place all contaminated parts that have been cleaned and dried off by the user into the designated sealed box located in the cabinet under the centrifuges for the designated KGRI staff member.
- Grab a new pipette clamp kit (located in the cabinet under the centrifuges in sealed bags) which contains a clean aspirating cone, pipette adaptor, and seal and a new sterile membrane filter. Follow the assembly instructions outlined in Section 5.2.7 below.

5.2.7 Attaching the Pipette Clamp Unit to the Pipet Controllers

To reassemble the pipette clamp to the filter adaptor on the pipette controller (users **MUST** be wearing gloves during this step):

- Push the gasket and groove of the seal into the filter adaptor.
- Inert the female Leur-lok of the membrane filter into the silicone pipette adaptor by pushing the wide opening of the membrane filter into the narrow opening of the silicone pipette adaptor. Attach the membrane filter and silicone pipette adaptor to the pipet controller using the narrow opening on the membrane filter.
- Guide the aspirating cone over the membrane filter and silicone pipette adaptor and screw on the aspirating cone turning clockwise until it is engaged.
- To check to ensure the pipette controller is not leaking, attach a disposable serological pipette. Fill the disposable serological pipette with water. Hold the disposable serological pipette vertically. Observe the disposable serological pipette for at least 30 seconds. **DO NOT** touch the disposable serological pipette or press the control buttons. No water should leak out if the seal is tight. If water escapes, disassemble the pipette clamp unit and carefully reassemble the pipette clamp unit and retest.

6.0 SOP HISTORY

SOP Number	Date Issued	Summary of Revisions
SOP-P-01	01-DEC-2017	Original version.
SOP-PPC-02	01-MAY-2019	Bi-annual review of SOP completed. SOP header format updated. SOP version number updated. SOP effective date updated. SOP acronym revised from "SOP-P-01" to "SOP-PPC-02". Removed "References" and "Contacts" sections from SOP. Updated section number for "SOP History". Under Section 2.0, added "and pipet controllers". Under Section 4.0, under "User Responsibilities", under bullet 1, added "and pipet controllers". Under Section 4.0, under "User Responsibilities", under bullet 2, added "and pipet controllers". Under Section 4.0, under "User Responsibilities", under bullet 3, added "and pipet controllers". Under Section 4.0, under "User Responsibilities", under bullet 4, added "pipet controller" and "OR PIPETTE CONTROLLERS". Under Section 4.0, under "User Responsibilities", under bullet 5, added "and pipet controllers". Under Section 4.0, under "User Responsibilities", under bullet 6, added "and pipet controllers". Under Section 4.0, under "User Responsibilities", under bullet 9, added "and pipet controllers" and replaced "Oxivir®" with "Oxivir®/Accel® INTERVention". Under Section 4.0, under "KGHRI Responsibilities", under bullet 1, added "and pipet controllers". Under Section 4.0, under "KGHRI Responsibilities", under bullet 2, added "and pipet controllers" and replaced "is" with "are". Under Section 4.0, under "KGHRI Responsibilities", under bullet 3, added "and pipet controllers". Under Section 4.0, under "KGHRI Responsibilities", under bullet 6, replaced "Oxivir®" with "Oxivir®/Accel® INTERVention". Re-numbered Section 5.1, 5.2, and 5.3 to 5.1, 5.1.1, 5.1.2, and 5.1.3. Added new section title for 5.1: "Using the Pipettes". Updated Section title for 5.1.1: "Setting the Volume using the Pipettes". Updated Section title for 5.1.3: "Aspirating Liquid with the Pipettes". Added new section number Section 5.2: "Using the Pipet Controllers". Added new section number Section 5.2.1: "Checking the Battery Status and Charging the Pipet Controllers". Added new section number Section 5.2.2: "Inserting the Disposable Serological Pipette onto the Pipet Controller". Added new section number Section 5.2.3: "Adjusting the Speed Control on the Pipet Controller". Added new section number Section 5.2.4: "Aspirating and Dispensing using the Pipet

		<p><i>Controller</i>". Added new section number Section 5.2.5: "<i>Storing the Pipet Controllers</i>". Added new section number Section 5.2.6: "<i>Cleaning the Pipet Controllers</i>". Added new section number Section 5.2.7: "<i>Attaching the Pipette Clamp Unit to the Pipet Controllers</i>". Updated "SOP History" section. Added new appendix for pipettes operating manual. Added new appendix for pipet controllers operating manual.</p>
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