



Provincial Health Services Authority

Checklists

MODULE 1

APPENDIX 1

**Includes Step-by-Step
Procedures and Techniques
for the Safe Handling and Preparation of
Hazardous Drugs**

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Hand Hygiene for Personnel Working in the Clean Room

ACTIVITY/STANDARD

Plain or Antimicrobial Soap with Alcohol-Based Hand Rub (ABHR)

- under running water, use a disposable nail pick to remove debris from underneath fingernails
- wash hands and arms to elbows using plain or antimicrobial liquid soap for **30-60 seconds**
 - ✘ do NOT use a scrub brush on skin
- rinse soap from hands and arms with the water flowing away from hands towards elbows
- dry hands and arms using a clean low-lint towel
 - ✓ allow hands and arms to dry completely
 - ✓ use the towel to turn off the water taps (if applicable)
- dispose of the towel
- dispense a minimum of 2 full pumps of alcohol-based hand rub onto one palm
- immerse fingertips of the opposite hand into the ABHR for several seconds
- cover the hand and forearm (still of the opposite hand) with the ABHR and continue rubbing until it fully evaporates (at least 15 seconds)
- repeat with the other hand and forearm allowing the ABHR to fully evaporate
- once hands are completely dry, don first (inner) pair of sterile chemotherapy gloves (see Donning of Personal Protective Equipment to Enter a Hazardous Drug Clean Room When Not Working in a Biological Safety Cabinet OR Donning of Personal Protective Equipment When Working in a Biological Safety Cabinet)
- don chemotherapy gown
- don second (outer) pair of sterile chemotherapy gloves

Antimicrobial Soap (for use if personnel have a sensitivity to ABHR)

- under running water, use a disposable nail pick to remove debris from underneath fingernails
- wash hands and arms to elbows using an antimicrobial liquid soap for **2 to 3 minutes**
 - ✘ do NOT use a scrub brush on skin
- rinse soap from hands and arms with the water flowing away from hands towards elbows
- dry hands and arms using a clean low-lint towel
 - ✓ allow hands and arms to dry completely
 - ✓ use the towel to turn off the water taps (if applicable)
- once hands are completely dry, don first (inner) pair of sterile chemotherapy gloves (see Donning of Personal Protective Equipment to Enter a Hazardous Drug Clean Room When Not Working in a Biological Safety Cabinet OR Donning of Personal Protective Equipment When Working in a Biological Safety Cabinet)
- don chemotherapy gown
- don second (outer) pair of sterile chemotherapy gloves

Donning of Personal Protective Equipment to Enter the Controlled Area to Work in the Set-up Room

ACTIVITY/STANDARD

Do NOT bring cell phones, electronic tablets, or other personal electronic devices into the controlled area

- replace street clothes with scrubs
 - ✓ don a tied isolation gown or buttoned lab coat over scrubs
- ensure full leg coverage
- prior to entry into the controlled area:
 - ✓ remove artificial nails / nail extensions, and nail polish
 - ✓ remove cosmetics, false eyelashes, perfume, tattoos (henna and paper)
 - ✓ remove jewellery (e.g., watches, rings, necklaces, earrings, piercings [including nose rings] and lanyards)
 - ✓ clean glasses (if worn)
- enter the gowning room
- by the door leading from the general pharmacy:
 - ✓ hang up isolation gown or lab coat on the hooks by the door leading in from the general pharmacy
 - ✓ don hair cover(s) / beard cover- use a mirror, ensure **all** hair is tucked inside and ears are covered
 - ✓ don one pair of shoe covers
- select a new appropriately sized isolation gown
- wash hands and wrists thoroughly using soap and water for at least 30 seconds
 - ✗ do NOT use a scrub brush on skin
- dry hands and wrists using a clean low-lint towel (use the towel to turn off taps if applicable)
- don first (inner) pair of non-sterile chemotherapy gloves and examine for holes, tears or other defects
- don isolation gown and examine for any holes, tears or other defects
 - ✓ place cuffs of gown over the cuffs of the first pair of non-sterile chemotherapy gloves
- ensure full closure of the gown (fasten around the waist and neck)
- don second (outer) pair of non-sterile chemotherapy gloves, fitted over the cuffs of the gown to completely cover wrists and examine for any holes, tears or other defects
- enter the set-up room

**Donning of Personal Protective Equipment to Enter a Hazardous Drug Clean Room When Not Working in a Biological Safety Cabinet
(for controlled area with anteroom and clean room only)**

ACTIVITY/STANDARD

Do NOT bring cell phones, electronic tablets, or other personal electronic devices into the controlled area

- replace street clothes with scrubs
 - ✓ don a tied isolation gown or buttoned lab coat over scrubs
- ensure full leg coverage
- prior to entry into the controlled area:
 - ✓ remove artificial nails / nail extensions, and nail polish
 - ✓ remove cosmetics, false eyelashes, perfume, tattoos (henna and paper)
 - ✓ remove jewellery (watches, rings, necklaces, earrings, piercings [including nose rings] and lanyards)
 - ✓ clean glasses (if worn)
- enter the anteroom

On the dirty side of the demarcation line in the anteroom

- hang up isolation gown or lab coat on the hooks by the door
- don hair cover(s) / beard cover- use a mirror, ensure **all** hair is tucked inside and ears are covered
- don a medical mask covering face from the bridge of the nose down to include just under the chin
- don two shoe covers over one shoe and step that foot over the demarcation line (onto the clean side of the anteroom)
- don two shoe covers over the other shoe and step that foot over the demarcation line (onto the clean side of the anteroom)
 - ✗ do not step down on the clean side of the demarcation line without two pairs of shoe covers on your shoes
 - ✗ do not step down on the dirty side of the demarcation line with shoe covers on your shoes

On the clean side of the demarcation line in the anteroom

- select a new appropriately sized isolation gown
- select two pairs of appropriately sized sterile or non-sterile chemotherapy gloves; if wearing sterile chemotherapy gloves, open the package
- perform hand hygiene (see Hand Hygiene for Personnel Working in the Clean Room)
- don first (inner) pair of sterile or non-sterile chemotherapy gloves and examine for holes, tears or other defects
- don isolation gown and examine for any holes, tears or other defects
- ensure full closure of the gown (fasten around the waist and neck)
- place cuffs of the gown over the cuffs of the first pair of chemotherapy gloves
- don second (outer) pair of sterile or non-sterile chemotherapy gloves, fitted over cuffs of gown to completely cover wrists and examine for any holes, tears or other defects
- enter the clean room

Donning of Personal Protective Equipment to Enter a Hazardous Drug Clean Room When Not Working in a Biological Safety Cabinet (for controlled area with other rooms in addition to anteroom and clean room)

ACTIVITY/STANDARD

Do NOT bring cell phones, electronic tablets, or other personal electronic devices into the controlled area

- replace street clothes with scrubs
 - ✓ don a tied isolation gown or buttoned lab coat over scrubs
- ensure full leg coverage
- prior to entry into the controlled area:
 - ✓ remove artificial nails / nail extensions, and nail polish
 - ✓ remove cosmetics, false eyelashes, perfume, tattoos (henna and paper)
 - ✓ remove jewellery (watches, rings, necklaces, earrings, piercings [including nose rings] and lanyards)
 - ✓ clean glasses (if worn)
- enter the gowning room
- by the door leading from the general pharmacy:
 - ✓ hang up isolation gown or lab coat on the hooks by the door leading in from the general pharmacy
 - ✓ don hair cover(s) / beard cover- use a mirror, ensure **all** hair is tucked inside and ears are covered
 - ✓ don one pair of shoe covers
- select a new appropriately sized isolation gown
- wash hands and wrists thoroughly using soap and water for at least 30 seconds
 - ✗ do NOT use a scrub brush on skin
- dry hands and wrists using a clean low-lint towel (use the towel to turn off taps if applicable)
- don a pair of non-sterile chemotherapy gloves and examine for holes, tears or other defects
- don isolation gown and examine for any holes, tears or other defects
 - ✓ place cuffs of gown over the cuffs of the non-sterile chemotherapy gloves
- ensure full closure of the gown (fasten around the waist and neck)
- if not going directly through to the anteroom, don a second (outer) pair of non-sterile chemotherapy gloves, fitted over the cuffs of the gown to completely cover wrists) and examine for any holes, tears or other defects
- enter the set-up room
- enter the anteroom room

On the dirty side of the demarcation line in the anteroom

- do not remove the isolation gown that was donned in the gowning room
- don a medical mask covering face from the bridge of the nose down to include just under the chin
- don one (outer) shoe cover (over the inner shoe cover that was donned in the gowning room) and step that foot over the demarcation line (onto the clean side of the anteroom)
- don the second (outer) shoe cover (over the inner shoe cover that was donned in the gowning room) and step that foot over the demarcation line (onto the clean side of the anteroom)
 - ✗ do not step down on the clean side of the demarcation line without two pairs of shoe covers on your shoes
 - ✗ do not step down on the dirty side of the demarcation line with two pairs of shoe covers on your shoes

On the clean side of the demarcation line in the anteroom

- select two new pairs of appropriately sized sterile or non-sterile chemotherapy gloves; if wearing sterile chemotherapy gloves, open the package
- remove gloves that were donned in the gowning room and dispose of them into an appropriate waste container

- pull cuffs of the isolation gown above the elbows
- perform hand hygiene (see Hand Hygiene for Personnel Working in the Clean Room)
- don first (inner) pair of sterile or non-sterile chemotherapy gloves and examine for holes, tears or other defects
- place cuffs of the isolation gown over the cuffs of the first pair of chemotherapy gloves
- don second (outer) pair of sterile or non-sterile chemotherapy gloves, fitted over cuffs of gown to completely cover wrists and examine for any holes, tears or other defects
- enter the clean room

Donning of Personal Protective Equipment When Working in a Biological Safety Cabinet (for controlled area with anteroom and clean room only)

ACTIVITY/STANDARD

Do NOT bring cell phones, electronic tablets, or other personal electronic devices into the controlled area

- replace street clothes with scrubs
 - ✓ don a tied isolation gown or buttoned lab coat over scrubs
- ensure full leg coverage
- prior to entry into the controlled area:
 - ✓ remove artificial nails / nail extensions, and nail polish
 - ✓ remove cosmetics, false eyelashes, perfume, tattoos (henna and paper)
 - ✓ remove jewellery (watches, rings, necklaces, earrings, piercings [including nose rings] and lanyards)
 - ✓ clean glasses (if worn)
- enter the anteroom

On the dirty side of the demarcation line in the anteroom

- hang up isolation gown or lab coat on the hooks by the door
- don hair cover(s) / beard cover- use a mirror, ensure **all** hair is tucked inside and ears are covered
- don a medical mask covering face from the bridge of the nose down to include just under the chin
or
- if work will include decontaminating the biological safety cabinet (BSC):
 - ✓ don a NIOSH-approved elastomeric half face mask respirator with appropriate filter cartridges (see [Elastomeric Half Face Mask Respirator Donning and Doffing Procedure: VI-20](#))
 - before each use of a respirator, positive and negative pressure seal checks must be performed to ensure proper functioning
 - ✓ don a medical mask over the respirator (NOT under) if the exhalation valve on the respirator is not filtered
- don two shoe covers over one shoe and step that foot over the demarcation line (onto the clean side of the anteroom)
- don two shoe covers over the other shoe and step that foot over the demarcation line (onto the clean side of the anteroom)
 - ✗ do not step down on the clean side of the demarcation line without two pairs of shoe covers on your shoes
 - ✗ do not step down on the dirty side of the demarcation line with shoe covers on your shoes

On the clean side of the demarcation line in the anteroom

- select an appropriately sized chemotherapy gown
- select and open two pairs of appropriately sized sterile chemotherapy gloves
- if work will include decontaminating the BSC, don safety goggles with side shields and a face shield over the respirator
- perform hand hygiene (see Hand Hygiene for Personnel Working in the Clean Room)
- don first (inner) pair of sterile chemotherapy gloves and examine for holes, tears or other defects
- don chemotherapy gown and examine for any holes, tears or other defects
- ensure full closure of the gown (fasten around the waist and neck)
- place cuffs of the gown over the cuffs of the first pair of sterile chemotherapy gloves
- don second (outer) pair of sterile chemotherapy gloves, fitted over cuffs of gown to completely cover wrists and examine for any holes, tears or other defects
- enter the clean room

Donning of Personal Protective Equipment When Working in a Biological Safety Cabinet (for controlled area with other rooms in addition to anteroom and clean room)

ACTIVITY/STANDARD

Do NOT bring cell phones, electronic tablets, or other personal electronic devices into the controlled area

- replace street clothes with scrubs
 - ✓ don a tied isolation gown or buttoned lab coat over scrubs
- ensure full leg coverage
- prior to entry into the controlled area:
 - ✓ remove artificial nails / nail extensions, and nail polish
 - ✓ remove cosmetics, false eyelashes, perfume, tattoos (henna and paper)
 - ✓ remove jewellery (watches, rings, necklaces, earrings, piercings [including nose rings] and lanyards)
 - ✓ clean glasses (if worn)
- enter the gowning room
- by the door leading from the general pharmacy:
 - ✓ hang up isolation gown or lab coat on the hooks by the door leading in from the general pharmacy
 - ✓ don hair cover(s) / beard cover- use a mirror, ensure **all** hair is tucked inside and ears are covered
 - ✓ don one pair of shoe covers
- select a new appropriately sized isolation gown
- wash hands and wrists thoroughly using soap and water for at least 30 seconds
 - ✗ do NOT use a scrub brush on skin
- dry hands and wrists using a clean low-lint towel (use the towel to turn off taps if applicable)
- don a pair of non-sterile chemotherapy gloves and examine for holes, tears or other defects
- don isolation gown and examine for any holes, tears or other defects
 - ✓ place cuffs of gown over the cuffs of the non-sterile chemotherapy gloves
- ensure full closure of the gown (fasten around the waist and neck)
- if not going directly through to the anteroom, don a second (outer) pair of non-sterile chemotherapy gloves, fitted over cuffs of gown to completely cover wrists and examine for any holes, tears or other defects
- enter the set-up room
- enter the anteroom room

On the dirty side of the demarcation line in the anteroom

- remove the isolation gown that was donned in the gowning room and hang up on the dirty side of the demarcation line for later use
- don a medical mask covering face from the bridge of the nose down to include just under the chin
or
- if work will include decontaminating the biological safety cabinet (BSC):
 - ✓ don a NIOSH-approved elastomeric half face mask respirator with appropriate filter cartridges (see [Elastomeric Half Face Mask Respirator Donning and Doffing Procedure: VI-20](#))
 - before each use of a respirator, positive and negative pressure seal checks must be performed to ensure proper functioning
 - don a medical mask over the respirator (NOT under) if the exhalation valve on the respirator is not filtered
- don one (outer) shoe cover (over the inner shoe cover that was donned in the gowning room) and step that foot over the demarcation line (onto the clean side of the anteroom)

- don the second (outer) shoe cover (over the inner shoe cover that was donned in the gowning room) and step that foot over the demarcation line (onto the clean side of the anteroom)
 - ✘ do not step down on the clean side of the demarcation line without two pairs of shoe covers on your shoes
 - ✘ do not step down on the dirty side of the demarcation line with two pairs of shoe covers on your shoes

On the clean side of the demarcation line in the anteroom

- select an appropriately sized chemotherapy gown
- select and open two new pairs of appropriately sized sterile chemotherapy gloves
- remove gloves that were donned in the gowning room and dispose of them into an appropriate waste container
- if work will include decontaminating the BSC, don safety goggles with side shields and a face shield over the respirator
- perform hand hygiene (see Hand Hygiene for Personnel Working in the Clean Room)
- don first (inner) pair of sterile chemotherapy gloves and examine for holes, tears or other defects
- don chemotherapy gown and examine for any holes, tears or other defects
- ensure full closure of the gown (fasten around the waist and neck)
- place cuffs of the gown over the cuffs of the first pair of sterile chemotherapy gloves
- don second (outer) pair of sterile chemotherapy gloves, fitted over cuffs of gown to completely cover wrists and examine for any holes, tears or other defects
- enter the clean room

Exiting the Clean Room to Wash Hands Every 30 Minutes during Hazardous Drug (HD) Compounding

ACTIVITY/STANDARD

- to remove outer pair of sterile chemotherapy gloves inside the clean room, either:
 - ✓ remove and dispose of outer gloves into a hazardous waste container inside the biological safety cabinet (BSC)
or
 - ✓ decontaminate outer gloves using a decontaminating agent prior to removal of hands from the BSC, then remove and dispose of outer gloves into a hazardous waste container inside the clean room, outside of the BSC
 - ✗ do NOT touch anything in the clean room while wearing only one pair of chemotherapy gloves
- remove chemotherapy gown close to the door and hang inside the clean room
 - to minimize the chance of spreading HD contamination to other areas of the pharmacy, a chemotherapy gown that has been worn when mixing hazardous drugs in the BSC must not be worn outside of the clean room
- while still wearing the inner pair of sterile chemotherapy gloves, open the door leading out of the clean room
- to step out of the clean room to the clean side of the anteroom:
 - ✓ remove one outer shoe cover just inside the clean room and step that foot out
 - ✓ repeat for the other outer shoe cover
 - ✓ dispose of outer shoe covers into a hazardous waste container inside the clean room
 - ✗ do NOT step down inside the clean room wearing only the inner pair of shoe covers
 - ✗ do NOT step down outside the clean room wearing the outer pair of shoe covers that were worn in the clean room

On the clean side of the demarcation line in the anteroom

- do NOT remove hair cover(s) / beard cover or medical mask at this time
- remove inner sterile chemotherapy gloves and dispose of them into a hazardous waste container
- don a new pair of outer shoe covers over inner pair of shoe covers
- select and open two pairs of appropriately sized sterile chemotherapy gloves
- wash hands and wrists thoroughly using plain or antimicrobial soap and water for at least 30 seconds followed by application of alcohol-based hand rub (ABHR) (for proper use of ABHR, see Hand Hygiene for Personnel Working in the Clean Room)
 - ✗ do NOT use a scrub brush on skin
- dry hands and wrists using a clean low-lint towel (use the towel to turn off taps if applicable)
- don first (inner) pair of sterile chemotherapy gloves and examine for holes, tears or other defects
- bring second (outer) pair of sterile chemotherapy gloves into the clean room
- in the clean room, don the chemotherapy gown and re-examine for any holes, tears or other defects
- ensure full closure of the chemotherapy gown (fasten around the waist and neck)
- place cuffs of the gown over cuffs of the first pair of sterile chemotherapy gloves
- don second (outer) pair of sterile chemotherapy gloves, fitted over cuffs of gown to completely cover wrists and examine for any holes, tears or other defects
- continue working in the biological safety cabinet

Removal of Personal Protective Equipment to Exit the Clean Room When Not Working in a Biological Safety Cabinet (for controlled area with anteroom and clean room only)

ACTIVITY/STANDARD

- to step out of the clean room to the clean side of the anteroom:
 - ✓ remove one outer shoe cover just inside the clean room and step that foot out
 - ✓ repeat for the other outer shoe cover
 - ✓ dispose of outer shoe covers into a hazardous waste container inside the clean room
 - ✗ do NOT step down inside the clean room wearing only the inner pair of shoe covers
 - ✗ do NOT step down outside the clean room wearing the outer pair of shoe covers that were worn in the clean room

On the clean side of the demarcation line in the anteroom

- do NOT remove hair cover(s) / beard cover or medical mask at this time
- remove outer non-sterile or sterile chemotherapy gloves and dispose of them into a hazardous waste container
- remove isolation gown and discard it (if disposable) or place in laundry bin (if reusable)
- remove inner chemotherapy gloves and dispose of them into a hazardous waste container
- wash hands using soap and water (NOT alcohol-based hand rub) **immediately** after removal of inner gloves and dry using a low-lint towel
- to step over the demarcation line from the 'clean' side of the anteroom to the 'dirty' side:
 - ✓ don a new pair of non-sterile chemotherapy gloves and examine for any holes, tears or other defects
 - ✓ remove one inner shoe cover and step over the demarcation line
 - ✓ repeat with other inner shoe cover
 - ✗ do not step down on the clean side of the demarcation line without shoe covers on your shoes
 - ✗ do not step down on the dirty side of the demarcation line with shoe covers on your shoes

On the dirty side of the demarcation line in the anteroom

- remove hair cover(s) / beard cover and medical mask
- remove non-sterile chemotherapy gloves
- discard disposable PPE into a hazardous waste container
- don a tied isolation gown or a buttoned lab coat over scrubs before leaving the anteroom

After leaving the anteroom

- in the general pharmacy, immediately wash hands again using soap and water (NOT alcohol-based hand rub)

Removal of Personal Protective Equipment to Exit the Clean Room When Not Working in a Biological Safety Cabinet (for controlled area with other rooms in addition to anteroom and clean room)

ACTIVITY/STANDARD

- to step out of the clean room to the clean side of the anteroom:
 - ✓ remove one outer shoe cover just inside the clean room and step that foot out
 - ✓ repeat for the other outer shoe cover
 - ✓ dispose of outer shoe covers into a hazardous waste container inside the clean room
 - ✗ do NOT step down inside the clean room wearing only the inner pair of shoe covers
 - ✗ do NOT step down outside the clean room wearing the outer pair of shoe covers that were worn in the clean room

On the clean side of the demarcation line in the anteroom

- do NOT remove isolation gown, hair cover(s) / beard cover or medical mask at this time
- remove outer non-sterile or sterile chemotherapy gloves and dispose of them into a hazardous waste container

To move directly from the anteroom to the gowning room

- examine inner non-sterile or sterile chemotherapy gloves for holes, tears or other defects
- examine isolation gown for holes, tears or other defects
- step over the demarcation line to the dirty side of the anteroom
 - ✗ do NOT remove the inner pair of shoe covers at this time
- refer to 'On the dirty side of the demarcation line in the anteroom' and 'When ready to leave the controlled area' below

To work in the set-up room

- remove inner sterile or non-sterile chemotherapy gloves and dispose of them into a hazardous waste container
- wash hands using soap and water (NOT alcohol-based hand rub) **immediately** after removal of inner gloves and dry using a low-lint towel
- don a new (inner) pair of non-sterile chemotherapy gloves and examine for any holes, tears or other defects
- examine isolation gown for holes, tears or other defects
- don a second (outer) pair of non-sterile chemotherapy gloves and examine for holes, tears or other defects
- step over the demarcation line to the dirty side of the anteroom
 - ✗ do NOT remove the inner pair of shoe covers at this time

On the dirty side of the demarcation line in the anteroom

- remove medical mask
- do NOT remove hair cover(s) / beard cover at this time
- enter the set-up room

When ready to leave the controlled area

- enter the gowning room
- if applicable, remove outer pair of non-sterile chemotherapy gloves (worn if work was performed in the set-up room)
- remove isolation gown and discard it (if disposable) or place in laundry bin (if reusable)
- remove hair cover(s) / beard cover
- remove inner pair of shoe covers
- remove inner pair of non-sterile chemotherapy gloves
- discard disposable PPE into a hazardous waste container
- wash hands using soap and water (NOT alcohol-based hand rub) **immediately** after removal of inner gloves and dry using a low-lint towel
- don a tied isolation gown or a buttoned lab coat over scrubs before leaving the gowning room

Removal of Personal Protective Equipment to Exit the Clean Room after Working in a Biological Safety Cabinet (for controlled area with anteroom and clean room only)

ACTIVITY/STANDARD

- to remove the outer pair of sterile chemotherapy gloves inside the clean room either:
 - ✓ remove and dispose of outer gloves into a hazardous waste container inside the biological safety cabinet (BSC)
 - or
 - ✓ using wipes moistened with a decontaminating agent, decontaminate outer gloves prior to removal of hands from the BSC, then remove outer gloves and dispose of them into a hazardous waste container inside the clean room, outside of the BSC
 - ✗ do NOT touch anything in the clean room while wearing only one pair of chemotherapy gloves
- remove the chemotherapy gown close to the door and dispose of it into a hazardous waste container in the clean room
 - to minimize the chance of spreading HD contamination to other areas of the pharmacy, a chemotherapy gown that has been worn when working in the BSC must not be worn outside of the clean room
- while still wearing the inner pair of sterile chemotherapy gloves, open the door leading out of the clean room
- to step out of the clean room to the clean side of the anteroom:
 - ✓ remove one outer shoe cover just inside the clean room and step that foot out
 - ✓ repeat for the other outer shoe cover
 - ✓ dispose of outer shoe covers into a hazardous waste container inside the clean room
 - ✗ do NOT step down inside the clean room wearing only the inner pair of shoe covers
 - ✗ do NOT step down outside the clean room wearing the outer pair of shoe covers that were worn in the clean room

On the clean side of the demarcation line in the anteroom

- do NOT remove hair cover(s) / beard cover or medical mask at this time
- remove face shield and safety goggles (if applicable)
- if removing a respirator on the clean side of the anteroom, immediately replace it with a medical mask
- remove inner sterile chemotherapy gloves and dispose of them into a hazardous waste container
- wash hands using soap and water (NOT alcohol-based hand rub) **immediately** after removal of inner gloves and dry using a low-lint towel
- to step over the demarcation line from the clean side of the anteroom to the dirty side:
 - ✓ don a new pair of non-sterile chemotherapy gloves and examine for any holes, tears or other defects
 - ✓ remove one inner shoe cover and step over the demarcation line
 - ✓ repeat with other inner shoe cover
 - ✗ do not step down on the clean side of the demarcation line without shoe covers on your shoes
 - ✗ do not step down on the dirty side of the demarcation line with shoe covers on your shoes

On the dirty side of the demarcation line in the anteroom

- remove hair cover(s) / beard cover and medical mask / respirator (if the respirator was not removed on the clean side of the demarcation line in the anteroom)
- remove non-sterile chemotherapy gloves
- discard disposable PPE into a hazardous waste container
- don a tied isolation gown or a buttoned lab coat over scrubs

After leaving the anteroom

- in the general pharmacy, immediately wash hands again using soap and water (NOT alcohol-based hand rub)

Note:

- ✓ reusable PPE must be decontaminated, cleaned and disinfected prior to storage per site procedures (see [Elastomeric Half Face Mask Respirator Cleaning and Decontaminating Procedure: VI-130](#))

Removal of Personal Protective Equipment to Exit the Clean Room after Working in a Biological Safety Cabinet (for controlled area with other rooms in addition to anteroom and clean room)

ACTIVITY/STANDARD

- to remove outer pair of sterile chemotherapy gloves inside the clean room either:
 - ✓ remove and dispose of outer gloves into a hazardous waste container inside the biological safety cabinet (BSC)
or
 - ✓ using wipes moistened with a decontaminating agent, decontaminate outer gloves prior to removal of hands from the BSC, then remove outer gloves and dispose of them into a hazardous waste container inside the clean room, outside of the BSC
 - ✗ do NOT touch anything in the clean room while wearing only one pair of chemotherapy gloves
- remove the chemotherapy gown close to the door and dispose of it into a hazardous waste container in the clean room
 - to minimize the chance of spreading HD contamination to other areas of the pharmacy, a chemotherapy gown that has been worn when working in the BSC must not be worn outside of the clean room
- while still wearing the inner pair of sterile chemotherapy gloves, open the door leading out of the clean room
- to step out of the clean room to the clean side of the anteroom:
 - ✓ remove one outer shoe cover just inside the clean room and step that foot out
 - ✓ repeat for the other outer shoe cover
 - ✓ dispose of outer shoe covers into a hazardous waste container inside the clean room
 - ✗ do NOT step down inside the clean room wearing only the inner pair of shoe covers
 - ✗ do NOT step down outside the clean room wearing the outer pair of shoe covers that were worn in the clean room

On the clean side of the demarcation line in the anteroom

- do NOT remove hair cover(s) / beard cover or medical mask at this time
- remove face shield and safety goggles (if applicable)
- if removing a respirator on the clean side of the anteroom, immediately replace it with a medical mask
- remove inner sterile chemotherapy gloves and dispose of them into a hazardous waste container
- wash hands using soap and water (NOT alcohol-based hand rub) **immediately** after removal of inner gloves and dry using a low-lint towel
- to step over the demarcation line from the clean side of the anteroom to the dirty side:
 - ✓ don one (inner) pair of non-sterile chemotherapy gloves and examine for holes, tears or other defects
 - ✓ remove one inner shoe cover and step over the demarcation line
 - ✓ repeat with other inner shoe cover
 - ✗ do not step down on the clean side of the demarcation line without shoe covers on your shoes
 - ✗ do not step down on the dirty side of the demarcation line with shoe covers on your shoes

On the dirty side of the demarcation line in the anteroom

- remove the medical mask / respirator (if the respirator was not removed on the clean side of the demarcation line in the anteroom)
- don the isolation gown that was worn when walking from the gowning room through the controlled area into the anteroom and re-examine for any holes, tears or other defects
- ensure full closure of the gown (fasten around the waist and neck)
- place cuffs of the gown over cuffs of the first pair of non-sterile chemotherapy gloves
 - it is not necessary to don a second (outer) pair of chemotherapy gloves if immediately walking through the controlled area to exit through the gowning room

To work in the set-up room

- don a second (outer) pair of non-sterile chemotherapy gloves and examine for holes, tears or other defects

- ✓ place cuffs of the outer pair of chemotherapy gloves over the cuffs of the chemotherapy gown

- exit the anteroom into the set-up room

Once ready to leave the controlled area

- enter the gowning room
- if applicable, remove outer pair of non-sterile chemotherapy gloves (worn if work was performed in the set-up room)
- **remove isolation gown and discard it (if disposable) or place in laundry bin (if reusable)**
- remove hair cover(s) / beard cover
- remove inner pair of shoe covers
- remove inner pair of non-sterile chemotherapy gloves
- discard disposable used PPE into a hazardous waste container
- wash hands using soap and water (NOT alcohol-based hand rub) **immediately** after removal of inner gloves and dry using a low-lint towel
- don a tied isolation gown or a buttoned lab coat over scrubs before leaving the gowning room

Note:

- ✓ reusable PPE must be decontaminated and disinfected prior to storage per site procedures (see [Elastomeric Half Face Mask Respirator Cleaning and Decontaminating Procedure: VI-130](#))

Morning Cleaning of Interior Surfaces of the Biological Safety Cabinet

ACTIVITY/STANDARD

- prior to cleaning the biological safety cabinet (BSC) (before the first preparation of the day):
 - ✓ place a sign on the outside of the clean room door indicating “**DO NOT ENTER - Cleaning / Decontaminating the BSC**”
 - ✓ wash hands and forearms (see Hand Hygiene for Personnel Working in the Clean Room)
 - ✓ don full personal protective equipment (PPE) including a NIOSH-approved elastomeric half face mask respirator with appropriate filter cartridges, safety goggles, and a face shield (see Donning of Personal Protective Equipment When Working in a Biological Safety Cabinet)
 - before each use of a respirator, positive and negative pressure seal checks must be performed to ensure proper functioning
 - don a medical mask over the respirator (NOT under) if the exhalation valve on the respirator is not filtered
 - ✓ ensure the ultraviolet light in the BSC is off and the cabinet is in operational mode with both the internal and external fans turned on
 - ✓ gather the necessary cleaning and disinfecting agents (e.g., germicidal disinfectant detergent, sterile 70% isopropyl alcohol) and supplies
- raise the viewing window to allow full access to the interior surfaces of the BSC
- hang a sealable plastic bag on a hook inside the BSC for disposal of the used wipes
 - ✓ ensure the hole in the plastic bag is above the zippered seal
- using low-lint wipes moistened with a germicidal disinfectant detergent, clean surfaces inside the BSC in the following order: (use at least one wipe for each surface)
 - ✓ ceiling grill (press gently to prevent damaging the high efficiency particulate air [HEPA] filter)
 - ✓ back wall
 - ✓ side walls and fixtures (gas or vacuum valves and bar and hooks if present)
 - ✓ work surface
 - ✓ front intake grill
 - ✓ inside surface of the viewing window
 - pull the viewing window part-way down to clean the inside surface
 - ✓ clean the outside surface of the viewing window
 - pull the viewing window down all the way to clean the outside surface
- wipe in the direction of airflow
 - ✓ wipe from upstream, closest to the HEPA filter to downstream away from the HEPA filter
 - ✓ slightly overlap the previous wipe
 - ✓ to wipe the work surface, work from the back of the BSC towards the front
- using low-lint wipes moistened with sterile 70% isopropyl alcohol, disinfect surfaces inside the BSC in the same order and direction as cleaning (use at least one wipe for each surface)
 - ✓ if the viewing window is made of plastic (e.g., PLEXIGLASS®), rinse with sterile water for irrigation to remove any residue from the cleaning agent, not alcohol
- seal, clean, and remove the zip lock bag from the BSC and dispose of it into a hazardous waste container
- place the viewing window at the manufacturer’s recommended height for aseptic compounding
- once the viewing window has been placed at the manufacturer’s recommended height for aseptic compounding, purge the BSC for a minimum of 15 minutes (unless otherwise recommended by the manufacturer) before any aseptic compounding takes place within the cabinet
- exit the clean room to replace the respirator with a new medical mask (see Removal of Personal Protective Equipment to Exit the Clean Room after Working in a Biological Safety Cabinet)
- don personal protective equipment if re-entering the clean room to begin hazardous drug compounding (see Donning of Personal Protective Equipment When Working in a Biological Safety Cabinet)
- document completed cleaning process

Note:

- ✓ reusable PPE must be decontaminated and disinfected prior to storage per site procedures (see [Elastomeric Half Face Mask Respirator Cleaning and Decontaminating Procedure: VI-130](#))

Daily Decontamination of Interior Surfaces of the Biological Safety Cabinet

ACTIVITY/STANDARD

- prior to decontaminating the biological safety cabinet (BSC) (after the last preparation of the day):
 - ✓ purge the BSC for at least five minutes (unless otherwise recommended by the manufacturer)
 - ✓ place a sign on the outside of the clean room door indicating **“DO NOT ENTER - Cleaning / Decontaminating the BSC”**
 - ✓ wash hands and forearms (see Removal of Personal Protective Equipment to Exit the Clean Room after Working in a Biological Safety Cabinet and Hand Hygiene for Personnel Working in the Clean Room)
 - ✓ don full personal protective equipment (PPE) including a NIOSH-approved elastomeric half face mask respirator with appropriate filter cartridges, safety goggles, and a face shield (see Donning of Personal Protective Equipment When Working in a Biological Safety Cabinet)
 - before each use of a respirator, positive and negative pressure seal checks must be performed to ensure proper functioning
 - don a medical mask over the respirator (NOT under) if the exhalation valve on the respirator is not filtered
 - ✓ ensure the ultraviolet light in the BSC is off and the cabinet is in operational mode with both the internal and external fans turned on
 - ✓ gather the necessary decontaminating, cleaning and disinfecting agents (e.g., decontaminating agent, germicidal disinfectant detergent, sterile 70% isopropyl alcohol) and supplies
 - if the decontaminating agent chosen contains a germicidal disinfectant detergent, then interior surfaces of the BSC may be decontaminated and then disinfected without the additional cleaning step
- raise the viewing window to allow full access to the interior surfaces of the BSC
- hang a sealable plastic bag on a hook inside the BSC for disposal of the used wipes
 - ✓ ensure the hole in the plastic bag is above the zippered seal
- close the lid of the sharps container
- decontaminate items from the supply tray and place into a zip lock bag (e.g., tweezers, pens); seal and remove the zip lock bag from the BSC
 - ✗ do NOT allow the zip lock bag to touch any surface inside the BSC
- using low-lint wipes moistened with a decontaminating agent, decontaminate: (use at least one wipe for each surface)
 - ✓ the outside of the sharps container and supply tray and remove from the BSC
 - ✓ surfaces inside the BSC in the following order
 - ceiling grill (press gently to prevent damaging the high efficiency particulate air [HEPA] filter)
 - back wall
 - side walls and fixtures (gas or vacuum valves and bar and hooks if present)
 - work surface
 - front intake grill
 - inside surface of the viewing window
 - pull the viewing window part-way down to decontaminate the inside surface
 - outside surface of the viewing window
 - pull the viewing window down all the way to decontaminate the outside surface
- wipe in the direction of airflow
 - ✓ wipe from upstream, closest to the HEPA filter to downstream away from the HEPA filter
 - ✓ slightly overlap the previous wipe
 - ✓ to wipe the work surface, work from the back of the BSC to the front
- use wipes moistened with a germicidal disinfectant detergent to clean surfaces of the BSC in the same order and direction as for decontaminating (this step may be omitted if the decontaminating agent used contains a germicidal disinfectant detergent) (use at least one wipe for each surface)
- use wipes moistened with sterile 70% isopropyl alcohol to disinfect surfaces of the BSC in the same order and direction as for decontaminating (use at least one wipe for each surface)

- ✓ if the viewing window is made of plastic (e.g., PLEXIGLASS®), rinse with sterile water for irrigation to remove any residue from the decontaminating and cleaning agents, not isopropyl alcohol
- seal, decontaminate, and remove the zip lock bag from the BSC and dispose of it into a hazardous waste container
- place the viewing window at the manufacturer's recommended height for aseptic compounding
- exit the clean room (see Removal of Personal Protective Equipment to Exit the Clean Room after Working in a Biological Safety Cabinet)
- document completed decontamination process

Note:

- ✓ reusable PPE must be decontaminated and disinfected prior to storage per site procedures (see [Elastomeric Half Face Mask Respirator Cleaning and Decontaminating Procedure: VI-130](#))

Weekly Decontamination of the Biological Safety Cabinet

ACTIVITY/STANDARD

Materials required for the procedure include

- ✓ decontaminating agent
- ✓ germicidal disinfectant detergent
 - If the decontaminating agent chosen contains a germicidal disinfectant detergent, then use of a separate germicidal disinfectant detergent is not necessary
- ✓ sporicidal agent
- ✓ sterile 70% isopropyl alcohol (IPA)
- ✓ clean, low-lint wipes (unless using pre-moistened wipes)
- ✓ sealable plastic bags

Process

- prior to decontaminating the biological safety cabinet (BSC):
 - ✓ purge the BSC for at least five minutes following the last preparation (unless otherwise recommended by the manufacturer)
 - ✓ place a sign on the outside of the clean room door indicating “**DO NOT ENTER - Cleaning / Decontaminating the BSC**”
 - ✓ wash hands and forearms (see Removal of Personal Protective Equipment to Exit the Clean Room after Working in a Biological Safety Cabinet and Hand Hygiene for Personnel Working in the Clean Room)
 - ✓ don full personal protective equipment (PPE) including a NIOSH-approved elastomeric half face mask respirator with appropriate filter cartridges, safety goggles, and a face shield (see Donning of Personal Protective Equipment When Working in a Biological Safety Cabinet)
 - before each use of a respirator, positive and negative pressure seal checks must be performed to ensure proper functioning
 - don a medical mask over the respirator (NOT under) if the exhalation valve on the respirator is not filtered
 - ✓ ensure the ultraviolet light in the BSC is off and the cabinet is in operational mode with both the internal and external fans turned on
 - ✓ gather the necessary decontaminating, cleaning, and disinfecting agents (e.g., decontaminating agent, germicidal disinfectant detergent (if applicable), sporicidal, sterile 70% isopropyl alcohol) and supplies
- raise the viewing window to allow full access to the interior surfaces of the BSC
- hang a sealable plastic bag on a hook inside the BSC for disposal of the used wipes
 - ✓ ensure the hole in the bag is above the zippered seal
- close the lid of the sharps container
- decontaminate items from the supply tray and place into a zip lock bag (e.g., tweezers, pens); seal and remove the zip lock bag from the BSC
 - ✗ do NOT allow the zip lock bag to touch any surface inside the BSC
- leave removable parts of the BSC inside the BSC during decontamination (e.g., bar, work surface tray)
- using low-lint wipes moistened with a decontaminating agent, decontaminate: (use at least one wipe for each surface)
 - ✓ the outside of the sharps container and supply tray and remove from the BSC
 - ✓ surfaces inside the BSC in the following order:
 - ceiling grill (press gently to prevent damaging the high efficiency particulate air [HEPA] filter)
 - back wall
 - side walls and fixtures (gas or vacuum valves and bar and hooks if present)
 - work surface
 - inside surface of the viewing window
 - pull the viewing window part-way down to decontaminate the inside surface
- in the direction of airflow

- ✓ wipe from upstream, closest to the HEPA filter to downstream away from the HEPA filter
- ✓ slightly overlap the previous wipe
- ✓ to wipe the work surface, work from the back of the BSC to the front
- lift or prop the work surface tray up to allow access underneath or have a second person (wearing appropriate PPE) hold the work surface tray up to allow for decontamination of the surfaces under the work tray
 - ✓ decontaminate the under surface of the work tray and the top and bottom of the front intake grill and shelving that holds the work tray and front intake grill
 - ✓ decontaminate the exposed drain spillage area twice, as this is considered heavily contaminated
 - ✓ ensure a firm hold on wipes to prevent them from being drawn up into the rear airflow vent
- use wipes moistened with a germicidal disinfectant detergent to clean all surfaces underneath and above the work tray in the same order and direction as for decontaminating (this step may be omitted if the decontaminating agent used contains a germicidal disinfectant detergent) (use at least one wipe for each surface)
- use wipes moistened with a sporicidal agent to disinfect all surfaces underneath and above the work tray in the same order and direction as for decontaminating (use at least one wipe for each surface)
- use wipes moistened with sterile 70% isopropyl alcohol to disinfect all surfaces underneath and above the work tray in the same order as for decontaminating (use at least one wipe for each surface)
 - ✓ if the viewing window is made of plastic (e.g., PLEXIGLASS®), rinse with sterile water for irrigation to remove any residue from the decontaminating and cleaning agents, not isopropyl alcohol
- seal, decontaminate, and remove the zip lock bag from the BSC and dispose of it into a hazardous waste container
- decontaminate, clean and disinfect the outer surfaces of the BSC, including the viewing window (lowered all the way down for full access) using low-lint wipes moistened with a decontaminating agent, then a germicidal disinfectant detergent (if applicable), followed by a sporicidal agent, and then sterile 70% IPA (or sterile water for irrigation on the viewing window if it is made of plastic)
 - ✓ dispose of the used wipes in the zip lock bag outside of the BSC
 - ✓ seal the zip lock bag and dispose of it in a hazardous waste container
- place the viewing window at the manufacturer's recommended height for aseptic compounding
- purge the BSC for a minimum of 30 minutes before working in the BSC (unless otherwise recommended by the manufacturer)
- exit the clean room (see Removal of Personal Protective Equipment to Exit the Clean Room after Working in a Biological Safety Cabinet)
- document completed decontamination process

Note:

- ✓ reusable PPE must be decontaminated and disinfected prior to storage per site procedures (see [Elastomeric Half Face Mask Respirator Cleaning and Decontaminating Procedure: VI-130](#))

Placement of Drugs and Supplies into the Biological Safety Cabinet

ACTIVITY/STANDARD

- ensure the biological safety cabinet's (BSC) viewing window is situated at the manufacturer's recommended height for aseptic compounding
- ensure the ultraviolet light in the BSC is off and the internal and external fans are on
- decontaminate and then disinfect the work surface of the BSC using low-lint wipes moistened with a decontaminating agent and then sterile 70% isopropyl alcohol:
 - ✓ between every preparation
 - ✓ before leaving the BSC for an extended period of time (e.g., break)
 - ✓ upon returning to work in the BSC after an extended period of time (e.g., break);
 - ✓ after the BSC has purged for at least 15 minutes post-full clean of all surfaces
 - ✓ when covering for a staff member who was mixing

Supplies & Non-Hazardous Drug Vials

- check the expiry date of the supplies and drug; if expired, do NOT use
- if not expired, disinfect the vial(s), intravenous solution bags, and protective over-wrap on supplies using a low-lint wipe moistened with sterile 70% isopropyl alcohol and immediately place directly onto the work surface of the BSC
 - ✓ open protective over-wrap and place supplies that have **protected or disinfectable** critical sites (e.g., syringes *with* tip caps, chemotherapy dispensing pins, ChemoLock™ Bag Spikes) directly onto the work surface inside the BSC - **not** onto the front grill
 - ✗ do not remove the outer wrap of supplies prior to placement inside the BSC **if** critical sites that are not protected and are not disinfectable will be exposed (e.g., syringes supplied by the manufacturer without tip caps, needles on winged infusion sets)
- disinfect outer gloves using a low-lint wipe moistened with sterile 70% isopropyl alcohol prior to placing hands into the BSC to mix sterile preparations

Non-Accessed Hazardous Drug (HD) Vials

- check the expiry date of the drug; if expired, do NOT use
- if not expired, disinfect the vial(s) using a low-lint wipe moistened with sterile 70% isopropyl alcohol and immediately place directly onto the work surface inside the BSC
 - ✗ do not use the same sterile 70% isopropyl alcohol wipe to disinfect multiple hazardous drugs
 - ✗ do not use the same sterile 70% isopropyl alcohol wipe to disinfect supplies after disinfecting a hazardous drug vial
 - ✓ one sterile 70% isopropyl alcohol wipe may be used on multiple vials of the **same** hazardous drug
 - ✓ one sterile 70% isopropyl alcohol wipe may be used to disinfect supplies first and THEN hazardous drug vials
 - ✓ dispose of the used wipe(s) immediately after use into a hazardous waste container

Accessed Vials

- check the puncture date and time written on the accessed vial
- if past the beyond-use date, do NOT use
- if not past the beyond-use date, disinfect the outside of the sealed zip lock bag(s) containing the vial(s) using a low-lint wipe moistened with sterile 70% isopropyl alcohol and immediately place directly onto the work surface inside the BSC
 - ✓ remove vial(s) from zip lock bag(s) **inside** the BSC
 - ✗ do NOT reuse the zip lock bag- dispose of it into a hazardous waste container inside the BSC immediately upon removal of the vial

Removal and/or Disposal of Used Supplies and the Final Product from the Biological Safety Cabinet

ACTIVITY/STANDARD

After the final product check via direct observation OR after taking all photos required for the final product check using PharmacyKeeper

Disposing of checked supplies and non-reusable vials inside the BSC

Syringes

➤ once the solution-filled syringe(s) have been checked via direct observation or photos have been taken:

- ✓ inject the drug into the final container (e.g., intravenous solution bag, Infusor™) (see Withdrawal of [Hazardous] Drug Solution from a Vial)
- ✓ dispose of the syringe / needle into the HD sharps container or syringe / ChemoLock™ Injector into the non-sharps hazardous waste container inside the BSC
- or
- ✓ dispose of the tip-capped syringe into the non-sharps hazardous waste container inside the BSC

Note:

- if using ChemoLock™, leave the ChemoLock™ Injector attached to all hazardous drug syringes – DO NOT REMOVE
- if using a needle, leave the capped needle on the syringe
- or
- remove the capped needle from the syringe and dispose of it into the sharps container
- immediately place a luer lock or a non-luer lock (slip) tip cap onto the syringe tip (if the syringe was used to withdraw HD)
 - × do NOT remove the needle and place the syringe (with the syringe tip exposed) onto the work surface of the BSC if the syringe was used to withdraw hazardous drug

Vials

➤ write the puncture date **and** time directly on the accessed vial(s)

➤ once the vial(s) have been checked via direct observation or photos have been taken:

- ✓ leave chemotherapy vents, chemotherapy dispensing pins and ChemoLock™ Vial Spikes in the vial stoppers – DO NOT REMOVE
- ✓ if a vial stopper has a chemotherapy dispensing pin inserted it must be disposed of and not reused even if drug remains in the vial
- ✓ dispose of the vial(s) into the appropriate hazardous waste container inside the BSC
 - all vials with a chemotherapy vent inserted MUST be disposed of into a sharps container
 - vials with a chemotherapy dispensing pin or a ChemoLock™ Vial Spike may be disposed of into a non-sharps waste container

Removal of reusable vials and the final product from the BSC

Vials

➤ write the puncture date **and** time directly on the accessed vial(s)

➤ once the vial(s) have been checked via direct observation or photos have been taken:

- ✓ if a vial stopper has a ChemoLock™ Vial Spike inserted – DO NOT REMOVE from the vial
- ✓ if a vial stopper has a chemotherapy vent inserted:
 - REMOVE the chemotherapy vent and dispose of it into the sharps container (do NOT recap the needle on the chemotherapy vent)
- ✓ if a vial stopper has a chemotherapy dispensing pin inserted it must be disposed of and not reused even if drug remains in the vial
 - dispose of the vial(s) into the appropriate hazardous waste container inside the BSC

➤ disinfect the vial stopper using a sterile 70% isopropyl alcohol swab and allow the alcohol to dry (if applicable)

- decontaminate gloves using a wipe moistened with a decontaminating agent and dispose of it into a hazardous waste container inside the BSC
- using a new wipe moistened with a decontaminating agent, decontaminate part of the reusable vial
- touch the *decontaminated* surface with a *decontaminated* glove to pick it up and then decontaminate the rest of the vial
- place the vial into a zip lock bag above the work surface or front grill (NOT outside the BSC), seal the bag and **then** remove from the BSC
- or
- once the vial has been decontaminated, place it onto the wipe (used side down) on the work surface of the BSC until ready to remove

Final product

- if a needle was used to inject hazardous drug into an infusion solution bag, wipe the port of the IV solution bag using a 70% isopropyl alcohol (IPA) swab immediately upon removal of the needle
- rotate the final product upside down and upright - check for leaks and inspect the solution for particulate (see Checking for Particulate in Vials, Syringes, and Final Products)
 - IV solution bag:
 - ✓ if the administration port of an IV solution bag contains a ChemoLock™ bag spike, examine the connection between the bag spike and the administration port for leaks
 - ✓ examine the injection port for leaks if it was used to add drug to the IV solution bag
 - syringe:
 - ✓ examine connection between the tip cap or the ChemoLock™ Injector and the syringe tip for leaks
 - Infusor™:
 - ✗ if using ChemoLock™ to inject hazardous drug into an Infusor™, do NOT remove the ChemoLock™ Port from the Infusor™ fill port; check the fill port connection and the distal end of the tubing for leaks
- decontaminate gloves using a wipe moistened with a decontaminating agent and dispose of it into a hazardous waste container inside the BSC
- using a new wipe moistened with a decontaminating agent, decontaminate part of the final product
- touch the *decontaminated* surface with a *decontaminated* glove to pick it up and then decontaminate the rest of the final product (including the tubing if applicable [e.g., when the final product is an Infusor™])
 - ✓ if not immediately removing the final product from the BSC, place it onto the wipe (used side down) on the work surface of the BSC until ready to remove
- remove the final product from the BSC and place onto a cleanable or disposable surface
- affix the patient-specific label and all auxiliary labels to the final product once it has been removed from the BSC
- once labelled, place the final product into a zip lock bag and seal
- take a photo of the labelled final product for the final product check (if using PharmacyKeeper for the final product check)
 - ✓ if PharmacyKeeper cannot be used for the final product check, then the final product check must be completed via direct observation

Decontaminate and then disinfect the BSC work surface between each preparation using wipes moistened with a decontaminating agent and then sterile 70% isopropyl alcohol

Note:

- ✓ use one new wipe for each item to be decontaminated
- ✗ do NOT touch any surfaces inside the BSC after decontaminating gloves prior to decontaminating the reusable vial(s) or the final product; re-decontaminate gloves if possible HD contamination has occurred
- ✗ do not place *decontaminated* final products onto the front grill or directly onto the work surface of the BSC

Priming Solution / Secondary Administration Sets Inside the Biological Safety Cabinet

ACTIVITY/STANDARD

Prior to adding hazardous drug to the intravenous (IV) solution bag

- ensure the correct solution / secondary administration set and IV solution bag for the drug being administered have been selected
- squeeze the solution bag to check for leaks
- close the roller clamp on the solution / secondary administration set
- remove the protective cover from the administration port of the IV solution bag
- remove the protective cover from the spike on the solution / secondary administration set
- insert the spike of the solution / secondary administration set firmly into the administration port of the IV solution bag
- hold the IV solution bag upright, or elevate the bag using a hook to allow the solution to flow freely from the bag into the tubing
- squeeze the drip chamber of the solution / secondary administration set to fill the chamber about half full with solution
- remove the protective cap from the distal end of the solution / secondary administration set tubing and save for later use or dispose of it into a hazardous waste container inside the BSC (if attaching a ChemoLock™ Injector to the distal end of the tubing)
 - ✘ do NOT allow the exposed end of the tubing (critical site) to touch any surface inside the biological safety cabinet
 - ✓ maintain first air to the distal end of the tubing until the tubing is primed with solution and the protective cap is re-attached or a ChemoLock™ Injector is attached
- slowly open the roller clamp of the solution / secondary administration set to allow the solution to completely fill the tubing
- close the roller clamp as the solution reaches the distal end of the tubing
 - ✘ do NOT allow the solution to drip into the sharps or non-sharps container in the BSC as this could cause the hazardous drug in the container to aerosolize and/or vaporize into the BSC environment increasing the chance of exposure to hazardous drug
- examine the tubing for air bubbles
- remove air bubbles by tapping the sides of the tubing allowing them to move through the tubing to either end
- attach the protective cap or a ChemoLock™ Injector to the distal end of the solution / secondary administration set tubing
- **USE ASEPTIC TECHNIQUE THROUGHOUT**

Safely Capping Needles Used with Hazardous Drugs

ACTIVITY/STANDARD

Needle Cap Holder Method

- place the needle cap into the needle cap holder with the open end pointing up
- holding the syringe barrel, slowly bring the tip of the needle close to the opening of the needle cap
- place the tip of the needle inside the needle cap opening
- slide the needle completely inside the needle cap, securing the cap onto the needle hub
 - ✓ if drug has splashed from the needle into the needle cap, replace the needle with a new one prior to injecting the drug into a container
 - ✗ do NOT hold onto the needle cap holder while recapping the needle as this creates a 2-handed recapping of the needle

Note:

- **Use of a needle cap holder is the safest technique for recapping a needle used during hazardous drug preparation**

One-Handed (Scoop) Method

- move the needle cap on an alcohol swab into the work area
- holding the syringe barrel (with hand positioned above the barrel), slowly bring the tip of the needle close to the opening of the needle cap
- place the tip of the needle inside the needle cap opening – do not touch the needle cap with the other hand
- slide the needle inside the needle cap opening and follow through in an upward ‘scooping’ motion
- once the needle/syringe attachment is in an upright position, use the other hand to grasp the needle cap near the middle and secure it onto the needle hub

Note:

- ✗ Do NOT push on the distal end (tip) of the needle cap with your finger or hand to secure it onto the needle. The needle cap could break causing a needle stick injury
- ✗ Do NOT use two hands to recap a needle used during hazardous drug preparation
- **USE ASEPTIC TECHNIQUE THROUGHOUT**

Minimizing Core Formation When Using a Needle

ACTIVITY/STANDARD

Vials

- ensure the correct vial has been selected
- select a needle of appropriate gauge and attach to a syringe of appropriate size
 - or
- ready a chemotherapy vent
- remove the protective cap from the vial stopper and dispose of it into a hazardous waste container inside the biological safety cabinet (BSC)
- with the vial in an upright position, disinfect the vial stopper using a sterile 70% isopropyl alcohol (IPA) swab
 - ✓ wipe the vial stopper several (e.g., three) times in one direction
 - ✓ use a new alcohol swab to disinfect each critical site
- allow the alcohol to dry
- to remove the needle cap from the needle either:
 - ✓ attached to the syringe: place into a needle cap holder or on a sterile 70% IPA swab and store to the side of the work area
 - or
 - ✓ attached to the chemotherapy vent: dispose of the needle cap into a hazardous waste container inside the BSC
 - ✗ do NOT recap a chemotherapy vent needle; carefully remove the chemotherapy vent from the vial stopper and dispose of it into the sharps container inside the BSC without recapping the needle
- place the needle tip on the vial stopper at a 45° angle with the bevel of the needle facing upwards
- carefully exert downward pressure on the needle tip while positioning the needle into a vertical position
- if multiple punctures to a single vial stopper are necessary, do NOT insert a needle into the same hole in the vial stopper

Intravenous (IV) Solution Bags

- ensure the correct IV solution bag has been selected
- lay the IV solution bag on the work surface of the BSC
 - ✗ do NOT hang the IV solution bag from the bar in the BSC while injecting drug as this could cause the solution to follow the needle out of the injection port resulting in a spill
- disinfect the injection port of the IV solution bag using a sterile 70% isopropyl alcohol (IPA) swab
- allow the alcohol to dry
- remove the needle cap from the needle and place on a sterile 70% IPA swab or into a needle cap holder and store to the side of the work area
- hold the injection port perpendicular to the airflow so first air is able to flow unobstructed over the point at which the needle will enter the port
- place the needle tip onto the centre of the injection port
- exert pressure on the needle tip while inserting the needle straight through both port membranes into the solution bag with the needle shaft parallel to the port walls

Note:

- ✓ inspect the solution in each accessed container for particulate (see Checking for Particulate in Vials, Syringes, and Final Products)
- **USE ASEPTIC TECHNIQUE THROUGHOUT**

Removal of Air from a Syringe

ACTIVITY/STANDARD

If a needle was used to withdraw solution from a container

- remove air from a syringe while the needle is still inserted in the container (e.g., vial, diluent solution bag) whenever possible
- if air is present in the syringe after removing the needle from the container, recap the needle **before** removing air (see Safely Capping Needles Used with Hazardous Drugs)
- refer to *Removing air from a syringe* below

If a chemotherapy dispensing pin or dispensing pin / universal spike was used to withdraw solution from a container

- remove air from a syringe while the syringe is still attached to the container (e.g., vial, diluent solution bag) whenever possible
- if air is present in the syringe after removing the syringe from the container, either:
 - ✓ re-attach the syringe to the container
 - or
 - ✓ attach a needle to the syringe tip **before** removing air from the syringe; ensure the needle is capped
- refer to *Removing air from a syringe* below

If ChemoLock™ was used to withdraw solution from a container

- if air is present in the syringe after detaching the ChemoLock™ Injector from container (the ChemoLock™ Port on the Vial Spike or Bag Spike), re-attach the ChemoLock™ Injector to the ChemoLock™ Port
 - ✓ When using ChemoLock™ to withdraw and/or inject hazardous drug solution, NEVER remove the ChemoLock™ Injector from the syringe, exposing the tip of a hazardous drug-filled syringe
- refer to *Removing air from a syringe* below

Removing air from a syringe

- hold the syringe in a vertical position so the covered syringe tip is pointing upward (with the container or capped needle positioned higher than the syringe)
- pull the plunger of the syringe down slightly **first** to remove any solution from the needle or syringe tip, and either:
 - ✓ tap the syringe barrel with fingers, knuckles or tweezers just below any air bubbles to bring them to the top of the syringe
 - or
 - ✓ tilt and rotate the syringe causing larger air bubbles to move through the solution collecting smaller air bubbles at the top of the syringe
- pull the plunger of the syringe down slightly **again** to remove any solution that may have splashed into the needle hub or syringe tip
- slowly and carefully push up on the plunger to expel the small amount of air out
 - ✗ **NEVER** eject hazardous drug (HD) solution into a needle cap
- if hazardous drug solution has been *accidentally* expelled into the needle cap
 - ✓ remove the capped needle
 - ✓ dispose of the needle into the HD sharps container
 - attach a new needle before injecting the solution
 - or
 - attach a luer lock syringe tip for dispensing
- double check the final volume of solution in the syringe and adjust if necessary
- **USE ASEPTIC TECHNIQUE THROUGHOUT**

Withdrawal of Solution from an Intravenous Solution Bag Prior to Adding Drug when Using ChemoLock™

ACTIVITY/STANDARD

- ensure the correct IV solution bag has been selected
- squeeze the solution bag to check for leaks
- remove the protective cover from the administration port of the IV solution bag
- remove the protective cover from the spike end of the ChemoLock™ Bag Spike
- insert the ChemoLock™ Bag Spike firmly into the administration port of the IV solution bag up to the shoulder of the Bag Spike
- check the IV solution bag for leaks and inspect the solution for particulate (see Checking for Particulate in Vials, Syringes, and Final Products)
- luer lock a ChemoLock™ Injector to an appropriately sized syringe, rotating the Injector until an audible click is heard and it spins freely
- grasping the ChemoLock™ Port on the Bag Spike and the ChemoLock™ Injector attached to the syringe, push the two pieces straight together until an audible click is heard
 - ✘ do NOT hold onto the release clips on the Injector when connecting the Injector to the Port on the Bag Spike
- withdraw the correct volume of solution from the IV solution bag
- remove air bubbles from the syringe while the Injector/syringe is still attached to the Bag Spike
 - ✓ hold the syringe in a vertical position with the syringe tip pointing upward and the Bag Spike positioned higher than the syringe
 - ✓ tap the syringe barrel with fingers, knuckles or tweezers just below the air bubble(s) to bring them to the top of the syringe
 - ✓ tilt and rotate the syringe causing larger air bubbles to move through the solution collecting smaller air bubbles at the top of the syringe
 - ✓ slowly and carefully push up on the plunger to expel the small amount of air back into the IV solution bag
 - ✓ double check the final volume of solution in the syringe and adjust if necessary
- to disconnect the Injector/syringe from the Bag Spike, squeeze the release clips on the ChemoLock™ Injector
 - the ChemoLock™ Injector will automatically disconnect; do NOT pull apart when releasing
- write the solution type on the syringe barrel(s) using a thin-tipped permanent marker and take photo(s) of the solution-filled syringe(s) for the final product check (if using PharmacyKeeper for the final product check)
 - ✓ if PharmacyKeeper cannot be used for the final product check, then the final product check must be completed via direct observation, not by marking syringes
- **USE ASEPTIC TECHNIQUE THROUGHOUT**

Withdrawal of Solution from an Intravenous Solution Bag Using a Dispensing Pin / Universal Spike

ACTIVITY/STANDARD

- ensure the correct intravenous (IV) solution bag has been selected
- squeeze the solution bag to check for leaks
- remove the protective cover from the administration port of the IV solution bag
- remove the protective cover from the spike end of the dispensing pin / universal spike
- insert the spike end firmly into the administration port of the IV solution bag up to the shoulder of the dispensing pin / universal spike
- check the IV solution bag for leaks and inspect the solution for particulate (see Checking for Particulate in Vials, Syringes, and Final Products)
- attach the syringe to the IV solution bag:
 - ✓ remove the protective cap (critical site) from the distal end of the dispensing pin / universal spike (critical site) just prior to use and place on a sterile 70% isopropyl alcohol (IPA) swab to the side of the work area
 - ✓ attach an appropriately sized syringe onto the dispensing pin / universal spike
- withdraw the correct volume of solution from the IV solution bag
- remove air bubbles from the syringe while it is still attached to the dispensing pin / universal spike
 - ✓ hold the syringe in a vertical position so the syringe tip is pointing upward (with the dispensing pin / universal spike positioned higher than the syringe)
 - ✓ tap the syringe barrel with fingers, knuckles or tweezers just below the air bubble(s) to bring them to the top of the syringe
 - ✓ tilt and rotate the syringe causing larger air bubbles to move through the solution collecting smaller air bubbles at the top of the syringe
 - ✓ slowly and carefully push on the plunger to expel the small amount of air back into the IV solution bag
 - ✓ double check the final volume of solution in the syringe and adjust if necessary
- remove the syringe from the solution bag:
 - ✓ remove the syringe from the dispensing pin / universal spike
 - ✓ attach a capped needle or a tip cap (luer lock or non-luer lock) to the syringe tip
 - ✓ repeat with remaining syringe(s) or re-attach the protective cap to the distal end of the dispensing pin / universal spike (critical site)
- inspect the solution in the syringe for particulate (see Checking for Particulate in Vials, Syringes, and Final Products)
- write the solution type on the syringe barrel using a thin-tipped permanent marker and take photo(s) of the solution-filled syringe for the final product check (if using PharmacyKeeper for the final product check)
 - ✓ if PharmacyKeeper cannot be used for the final product check, then the syringe volume check must be completed via direct observation, not by marking syringes
- use a NEW syringe for each volume of solution to be measured
- **USE ASEPTIC TECHNIQUE THROUGHOUT**

Use of a Winged Infusion Set

ACTIVITY/STANDARD

If more than 2 punctures into an intravenous (IV) solution bag port are required when adding drug

- ensure the correct IV solution bag has been selected
- squeeze the solution bag to check for leaks
- lay the IV solution bag on the work surface of the biological safety cabinet (BSC)
 - ✖ do NOT hang the IV solution bag from the bar in the BSC while injecting hazardous drug as this could cause the solution to follow the needle out of the injection port resulting in a spill
- disinfect the injection port of the IV solution bag using a sterile 70% isopropyl alcohol (IPA) swab
- allow the alcohol to dry
- remove the winged infusion set from its protective over-wrap
- remove the needle cover of the winged infusion set and dispose of it into a hazardous waste container inside the BSC (do NOT save for recapping of the needle)
- hold the injection port perpendicular to the airflow so that first air is able to flow unobstructed over the point at which the needle will enter the port
- place the needle tip onto the centre of the injection port
- exert pressure on the needle tip while inserting the needle of the winged infusion set straight through both port membranes into the solution bag with the needle shaft parallel to the port walls
- remove the protective cap from the luer lock adaptor at the distal end of the winged infusion set and place on a sterile 70% IPA swab to the side of the work area
- if it is necessary to remove excess solution from the bag prior to the addition of drug (see Withdrawal of Solution from an Intravenous Solution Bag):
 - ✓ luer lock a syringe to the end of the winged infusion set
 - ✓ withdraw the required volume of solution from the IV solution bag
 - ✓ remove air from the syringe BEFORE detaching the syringe from the winged infusion set
 - ✓ verify the final volume of solution in the syringe and adjust if necessary
 - ✓ write the solution type on the syringe barrel using a thin-tipped permanent marker
 - ✓ remove the solution-filled syringe from the winged infusion set and attach a luer lock or non-luer lock tip cap to the syringe tip
 - ✓ repeat with remaining syringe(s) if necessary
 - ✓ re-attach the protective cap to the distal end of the winged infusion set
- verify the correct volume of drug for the dose is contained in the drug-filled syringes
- take photos of the solution- and drug-filled syringes for the final product check (if using PharmacyKeeper for the final product check)
 - ✓ if PharmacyKeeper cannot be used for the final product check, then the final product check must be completed via direct observation, not by marking syringes
- remove the protective cap from the distal end of the winged infusion set and place on a sterile 70% IPA swab to the side of the work area
- attach a drug-filled syringe, beginning with the smallest volume, to the luer-lock end of the winged infusion set
- inject the drug
- remove the syringe from the winged infusion set and attach a non-luer lock or a luer lock syringe tip cap
OR
- repeat with remaining syringe(s) until all drug has been injected into the IV solution bag
- to clear the tubing of drug (while the last emptied syringe is still attached to the winged infusion set):

- ✓ hold the solution bag with the injection port facing up
 - ✓ withdraw some air from the bag into the syringe
 - ✓ inject the withdrawn solution and the air back into the solution bag
 - remove the needle of the winged infusion set from the injection port of the IV solution bag and carefully place into the sharps container in the BSC
 - ✗ **do NOT recap the needle of the winged infusion set** unless using a safety winged infusion set with a safety feature that allows for recapping of the needle in a manner that does not increase the chance of a HD spill or splash when recapping
 - ✗ do not recap a safety winged infusion set that is designed in such a manner that the safety shield flips and snaps into place as it can cause HD to splash from the needle tip upon securing
 - remove the luer lock syringe from the distal end of the tubing and place the rest of the winged infusion set tubing into the sharps container
 - attach a non-luer lock or a luer lock syringe tip cap to the syringe
 - wipe the injection port of the IV solution bag using a sterile 70% IPA swab and allow the alcohol to dry
 - gently invert the bag to mix
 - gently squeeze the bag to check for leaks and inspect the solution for particulate (see Checking for Particulate in Vials, Syringes, and Final Products)
 - take a photo of the labelled final product for the final product check (if using PharmacyKeeper for the final product check)
 - ✓ If PharmacyKeeper cannot be used for the final product check, then the final product check must be completed via direct observation
- See Removal and/or Disposal of Used Supplies and the Final Product from the Biological Safety Cabinet
- **USE ASEPTIC TECHNIQUE THROUGHOUT**

Attaching a ChemoLock™ Vial Spike to a Hazardous Drug Vial

ACTIVITY/STANDARD

- ensure the correct hazardous drug (HD) vial has been selected
- ensure an appropriately sized ChemoLock™ Vial Spike has been selected
- remove the protective cap from the vial stopper and dispose of it into a hazardous waste container inside the biological safety cabinet (BSC)
- with the vial in an upright position on the work surface, disinfect the vial stopper using a sterile 70% isopropyl alcohol (IPA) swab
 - ✓ wipe the vial stopper several (e.g., three) times in one direction
 - ✓ use a new alcohol swab to disinfect each critical site
- allow the alcohol to dry
- carefully remove the protective cover from the spike end of the ChemoLock™ Vial Spike and dispose of it into a hazardous waste container inside the BSC
- holding onto the Vial Spike just below the Port, firmly push the spike straight into the centre of the vial stopper until the legs snap fully onto the vial top and the device is flush with the top of the vial's aluminum band
- inspect the solution in each accessed vial for particulate (see Checking for Particulate in Vials, Syringes, and Final Products)
- write the puncture date **and** time directly on the accessed vial (see Removal and/or Disposal of Used Supplies and the Final Product from the Biological Safety Cabinet)
- **USE ASEPTIC TECHNIQUE THROUGHOUT**

Reconstitution of Hazardous Drug Using ChemoLock™

ACTIVITY/STANDARD

Do not use ChemoLock™ to withdraw diluent solution from the infusion solution bag as doing so will cause an additional 0.34 mL of diluent from the ChemoLock™ Injector to be added to the vial when the ChemoLock™ Vial Spike is flushed during reconstitution.

- insert an appropriately sized ChemoLock Vial Spike™ into a hazardous drug (HD) vial stopper (see Attaching a ChemoLock™ Vial Spike to a Hazardous Drug Vial)
- ensure the correct diluent solution bag has been selected and attach a dispensing pin / universal spike (see Withdrawal of Solution from an Intravenous Solution Bag Using a Dispensing Pin / Universal Spike)
 - ✓ squeeze the diluent solution bag to check for leaks
 - ✓ remove the protective cover from the administration port of the diluent solution bag
 - ✓ remove the protective cover from the spike on the dispensing pin / universal spike
 - ✓ insert the spike firmly into the administration port of the diluent solution bag
 - ✓ check the diluent solution bag for leaks and inspect the solution for particulate (see Checking for Particulate in Vials, Syringes, and Final Products)
- select syringe(s) of appropriate size for the total volume of diluent to be injected into one vial (measure a single volume of diluent for one vial per syringe; do NOT measure a volume of diluent necessary to reconstitute drug in multiple vials into one syringe at one time)
- remove the protective cap from the distal end of the dispensing pin / universal spike inserted in the diluent solution bag just prior to use (critical site) and place on a sterile 70% IPA swab to the side of the work area
- attach a syringe to the dispensing pin / universal spike and withdraw the volume of diluent necessary for ONE vial into the syringe
 - ✓ remove air from the syringe while the syringe is still attached to the dispensing pin / universal spike
- remove the syringe from the dispensing pin / universal spike and luer lock a ChemoLock™ Injector onto the syringe, rotating the Injector until an audible click is heard and it spins freely
- inspect the solution in the syringe for particulate (see Checking for Particulate in Vials, Syringes, and Final Products)
- repeat with remaining syringe(s) if applicable
- reattach the protective cap onto the distal end of the dispensing pin / universal spike
- write the solution type on the syringe barrel(s) using a thin-tipped permanent marker and take photo(s) of the solution-filled syringe(s) for the final product check (if using PharmacyKeeper for the final product check)
 - ✓ if PharmacyKeeper cannot be used for the final product check, then the final product check must be completed via direct observation, not by marking syringes
- grasping the ChemoLock™ Port on the Vial Spike and the ChemoLock™ Injector attached to a diluent-filled syringe, push the two pieces straight together until an audible click is heard
 - ✘ do NOT hold onto the release clips on the Injector when connecting the Injector to the Port on the Vial Spike
- with the vial in an upright position, FIRST withdraw approximately 1 mL of air into the syringe and THEN inject the diluent and THEN air into the vial (the balloon will inflate as the pressure in the vial equalizes)
 - balloon capacity of 20 mm & 28 mm Vial Spikes = 100 mL; balloon capacity of 13 mm Vial Spike = 20 mL
 - air in the balloon remains in the balloon during withdrawal of solution from the vial
- detach the Injector / syringe from the Vial Spike:
 - ✓ squeeze the release clips on the ChemoLock™ Injector
 - the ChemoLock™ Injector will automatically disconnect; do NOT pull apart when releasing
- repeat with remaining diluent syringe(s) using the same technique until the total volume of diluent has been injected into the vial (if applicable)
- gently agitate the vial if appropriate for specific drug

- inspect the solution for undissolved drug and particulate (see Checking for Particulate in Vials, Syringes, and Final Products)
- write the reconstitution date **and** time directly on the accessed vial
- repeat with remaining syringes and vials (if reconstituting drug in more than one vial)
- take photo(s) of the vial(s) for the final product check (if using PharmacyKeeper for the final product check)
 - ✓ if PharmacyKeeper cannot be used for the final product check, then the final product check must be completed via direct observation

Note:

- always ensure the drug is completely dissolved (if appropriate for specific drug) before withdrawing a dose or storing for future use
- **USE ASEPTIC TECHNIQUE THROUGHOUT**

Reconstitution of Drug Using a Chemotherapy Dispensing Pin

ACTIVITY/STANDARD

- ensure the correct drug vial has been selected
- remove the protective cap from the vial stopper and dispose of it into a hazardous waste container inside the biological safety cabinet (BSC)
- with the vial in an upright position on the work surface, disinfect the vial stopper using a sterile 70% isopropyl alcohol (IPA) swab
 - ✓ wipe the vial stopper several (e.g., three) times in one direction
 - ✓ use a new alcohol swab to disinfect each critical site
- allow the alcohol to dry
- carefully remove the protective cover from the spike on the chemotherapy dispensing pin and dispose of it into a hazardous waste container inside the BSC
- holding the support flange / edge of the filter cover (depending on the type of chemotherapy dispensing pin used), firmly push the spike straight into the centre of the vial stopper
- ensure the correct diluent solution bag has been selected and attach a dispensing pin / universal spike (see Withdrawal of Solution from an Intravenous Solution Bag Using a Dispensing Pin / Universal Spike)
 - ✓ squeeze the diluent solution bag to check for leaks
 - ✓ remove the protective cover from the administration port of the diluent solution bag
 - ✓ remove the protective cover from the spike on the dispensing pin / universal spike
 - ✓ insert the spike firmly into the administration port of the diluent solution bag
 - ✓ check the diluent solution bag for leaks and inspect the solution for particulate (see Checking for Particulate in Vials, Syringes, and Final Products)
- select syringe(s) of appropriate size for the total volume of diluent to be injected into one vial (measure a single volume of diluent for one vial per syringe; do NOT measure a volume of diluent necessary to reconstitute drug in multiple vials into one syringe at one time)
- remove the protective cap from the distal end of the dispensing pin / universal spike inserted in the diluent solution bag just prior to use (critical site) and place on a sterile 70% IPA swab to the side of the work area
- attach a syringe to the dispensing pin / universal spike and withdraw the volume of diluent necessary for ONE vial into the syringe
 - ✓ remove air from the syringe while the syringe is still attached to the dispensing pin / universal spike
- remove the syringe from the dispensing pin / universal spike and attach a slip tip or a luer lock tip cap
- inspect the solution in the syringe for particulate (see Checking for Particulate in Vials, Syringes, and Final Products)
- repeat with remaining syringe(s) if applicable
- reattach the protective cap onto the distal end of the dispensing pin / universal spike
- write the solution type on the syringe barrel(s) using a thin-tipped permanent marker and take photo(s) of the solution-filled syringe(s) for the final product check (if using PharmacyKeeper for the final product check)
 - ✓ if PharmacyKeeper cannot be used for the final product check, then the final product check must be completed via direct observation, not by marking syringes
- remove the tip cap from a diluent-filled syringe
- remove the intermittent stopper cap from the access port of the chemotherapy dispensing pin and place on a 70% IPA swab to the side of the work area or dispose of it if the critical site-side is touch contaminated
- luer lock a diluent-filled syringe onto the exposed access port of the chemotherapy dispensing pin
- with the vial in an upright position on the work surface, inject the diluent into the vial – do this step **slowly** to avoid plugging the chemotherapy dispensing pin filter

- repeat with the remaining diluent syringe(s) using the same technique until the total volume of diluent has been injected into the vial
- once all the diluent has been added to the vial, **re-attach the intermittent stopper cap or a luer lock tip cap to the access port of the chemotherapy dispensing pin immediately after removal of the emptied syringe**
- gently agitate the vial (if appropriate for specific drug)
- inspect the solution for undissolved drug and particulate (see Checking for Particulate in Vials, Syringes, and Final Products)
- write the reconstitution date **and** time directly on the accessed vial
- repeat with remaining syringes and vials (if reconstituting drug in more than one vial)
- take photo(s) of the vial(s) for the final product check (if using PharmacyKeeper for the final product check)
 - ✓ if PharmacyKeeper cannot be used for the final product check, then the final product check must be completed via direct observation

Note:

- always ensure the drug is completely dissolved (if appropriate for specific drug) before withdrawing a dose or storing for future use
 - the chemotherapy dispensing pin should remain in the vial and be disposed of with the vial
 - use one chemotherapy dispensing pin per hazardous drug vial
 - do not withdraw drug from a vial that has a chemotherapy dispensing pin inserted once the vial has been removed from the BSC even if the vial is placed back into the BSC prior to the next withdrawal
- **USE ASEPTIC TECHNIQUE THROUGHOUT**

Reconstitution of Drug Using a Chemotherapy Vent

ACTIVITY/STANDARD

- ensure the correct drug vial has been selected
- remove the protective cap from the vial stopper and dispose of it into a hazardous waste container inside the biological safety cabinet (BSC)
- with the vial in an upright position on the work surface, disinfect the vial stopper using a sterile 70% isopropyl alcohol (IPA) swab
 - ✓ wipe the vial stopper several (e.g., three) times in one direction
 - ✓ use a new alcohol swab to disinfect each critical site
- allow the alcohol to dry
- carefully remove the cap from the needle of the chemotherapy vent and dispose of it into a hazardous waste container inside the BSC
- holding the support flange of the chemotherapy vent, insert the needle into the outer edge of the vial stopper
- ensure the bevel of the chemotherapy vent needle remains high in the vial (close to the vial stopper)
- ensure the correct diluent solution bag has been selected and attach a dispensing pin / universal spike (see Withdrawal of Solution from an Intravenous Solution Bag Using a Dispensing Pin / Universal Spike)
 - ✓ squeeze the diluent solution bag to check for leaks
 - ✓ remove the protective cover from the administration port of the diluent solution bag
 - ✓ remove the protective cover from the spike on the dispensing pin / universal spike
 - ✓ insert the spike firmly into the administration port of the diluent solution bag
 - ✓ check the diluent solution bag for leaks and inspect the contents for particulate (see Checking for Particulate in Vials, Syringes, and Final Products)
- select syringe(s) of appropriate size for the total volume of diluent to be injected into one vial (measure a single volume of diluent for one vial per syringe; do NOT measure a volume of diluent necessary to reconstitute drug in multiple vials into one syringe at one time)
- remove the protective cap from the distal end of the dispensing pin / universal spike inserted in the diluent solution bag just prior to use (critical site) and place on a sterile 70% IPA swab to the side of the work area
- attach a syringe to the dispensing pin / universal spike and withdraw the volume of diluent necessary for ONE vial into the syringe
 - ✓ remove air from the syringe while the syringe is still attached to the dispensing pin / universal spike
- remove the syringe from the dispensing pin / universal spike and attach a needle of appropriate gauge
- inspect the solution in the syringe for particulate (see Checking for Particulate in Vials, Syringes, and Final)
- repeat with remaining syringe(s) if applicable
- reattach the protective cap onto the distal end of the dispensing pin / universal spike
- write the solution type on the syringe barrel(s) using a thin-tipped permanent marker and take photo(s) of the solution-filled syringe(s) for the final product check (if using PharmacyKeeper for the final product check)
 - ✓ if PharmacyKeeper cannot be used for the final product check, then the final product check must be completed via direct observation, not by marking syringes
- remove the needle cap from the needle of the diluent-filled syringe and place on a 70% IPA swab or into a needle cap holder to the side of the work area
- insert the needle into the centre of the vial stopper so that its bevel is positioned lower inside the vial than the bevel of the chemotherapy vent needle
- with the vial in an upright position on the work surface, inject the diluent into the vial – do this step **slowly** to avoid splashing solution into the chemotherapy vent needle possibly plugging the filter

- ✓ maintain a path of first air to the chemotherapy vent filter
 - once all the diluent has been added to a vial, remove the needle from the vial stopper and carefully recap
 - repeat with the remaining diluent syringe(s) using the same technique until the total volume of diluent has been injected into the vial
 - ✘ do not insert the needle from subsequent syringe(s) into the vial stopper at the same point of entry as previous needle(s)
 - disinfect the vial stopper (around the chemotherapy vent needle) between each puncture using a new sterile 70% IPA swab
 - ✘ do not touch the chemotherapy vent needle with the alcohol swab
 - ✓ slide the chemotherapy vent as far into the vial as it will go without touching the hub to the vial stopper until ready to withdraw reconstituted drug from the vial
 - gently agitate the vial (if appropriate for specific drug) without splashing solution into the chemotherapy vent needle
 - inspect the solution for undissolved drug and particulate (see Checking for Particulate in Vials, Syringes, and Final Products)
 - write the reconstitution date **and** time directly on the accessed vial
 - repeat with remaining syringes and vials (if reconstituting drug in more than one vial)
 - take photo(s) of the vial(s) for the final product check (if using PharmacyKeeper for the final product check)
 - ✓ if PharmacyKeeper cannot be used for the final product check, then the final product check must be completed via direct observation
 - the chemotherapy vent may remain in the vial for withdrawal of the drug as long as the vial remains inside the biological safety cabinet (BSC) and a path of first air is maintained to the vial
 - the chemotherapy vent **must** be carefully removed from the vial if removing the vial from the BSC for any reason
 - ✘ **do NOT recap the needle** of the chemotherapy vent prior to disposing of it into the sharps container
 - ✓ disinfect the vial stopper with a sterile 70% IPA swab and allow the alcohol to dry
- If the filter of the chemotherapy vent becomes wet and plugged, equalization of pressure inside the vial will not occur. A new chemotherapy vent must be inserted into the vial stopper prior to removal of the plugged vent.**
- obtain a new chemotherapy vent
 - insert the needle of the plugged chemotherapy vent and the needle attached to the diluent-filled syringe further into the vial
 - disinfect the vial stopper around the needles with a sterile 70% IPA swab and allow the alcohol to dry
 - remove and dispose of the cap from the needle of a new chemotherapy vent
 - insert the new chemotherapy vent needle into the vial to equalize the pressure and **THEN** remove the plugged chemotherapy vent and the needle attached to the syringe
 - ✘ **do NOT recap the needle** of the chemotherapy vent prior to disposing of it into the sharps container
- Note:**
- Always ensure the drug is completely dissolved before withdrawing a dose or storing for future use
 - One chemotherapy vent may be transferred to more than one vial of the SAME drug for the SAME patient
- **USE ASEPTIC TECHNIQUE THROUGHOUT**

Reconstitution of Drug Using Negative Pressure Technique

ACTIVITY/STANDARD

Negative pressure technique must NOT be used for hazardous drug (HD) reconstitution if filter venting or closed system drug transfer devices are available. If negative pressure must be used (e.g., when preparing a clinical trials drug), care must be taken. Build-up of positive pressure within the vial will cause back spray of HD solution when the needle is removed. Excess negative pressure will result in spillage from the bevel of the needle when it is removed from the HD vial.

- ensure the correct drug vial has been selected
- remove the protective cap from the vial stopper and dispose of it into a hazardous waste container inside the biological safety cabinet (BSC)
- with the vial in an upright position on the work surface, disinfect the vial stopper using a sterile 70% isopropyl alcohol (IPA) swab
 - ✓ wipe the vial stopper several (e.g., three) times in one direction
 - ✓ use a new alcohol swab to disinfect each critical site
- allow the alcohol to dry
- ensure the correct diluent solution bag has been selected and attach a dispensing pin / universal spike (see Withdrawal of Solution from an Intravenous Solution Bag Using a Dispensing Pin / Universal Spike)
 - ✓ squeeze the diluent solution bag to check for leaks
 - ✓ remove the protective cover from the administration port of the diluent solution bag
 - ✓ remove the protective cover from the spike on the dispensing pin / universal spike
 - ✓ insert the spike firmly into the administration port of the diluent solution bag
 - ✓ check the diluent solution bag for leaks and inspect the solution for particulate (see Checking for Particulate in Vials, Syringes, and Final Products)
- select syringe(s) of appropriate size for the total volume of diluent to be injected into one vial (measure a single volume of diluent for one vial per syringe; do NOT measure a volume of diluent necessary to reconstitute drug in multiple vials into one syringe at one time)
- remove the protective cap from the distal end of the dispensing pin / universal spike inserted in the diluent solution bag just prior to use (critical site) and place on a sterile 70% IPA swab to the side of the work area
- attach a syringe to the dispensing pin / universal spike and withdraw the volume of diluent necessary for ONE vial into the syringe
 - ✓ remove air from the syringe while the syringe is still attached to the dispensing pin / universal spike
- remove the syringe from the dispensing pin / universal spike and attach a needle of appropriate gauge
- inspect the solution in the syringe for particulate (see Checking for Particulate in Vials, Syringes, and Final Products)
- repeat with remaining syringe(s) if applicable
- reattach the protective cap onto the distal end of the dispensing pin / universal spike
- write the solution type on the syringe barrel(s) using a thin-tipped permanent marker and take photo(s) of the solution-filled syringe(s) for the final product check (if using PharmacyKeeper for the final product check)
 - ✓ if PharmacyKeeper cannot be used for the final product check, then the final product check must be completed via direct observation, not by marking syringes
- remove the needle cap from the needle of a diluent-filled syringe and place on a 70% IPA swab or into a needle cap holder to the side of the work area
- insert the needle into the centre of the vial stopper
- with the vial in an upright position on the work surface, **first** withdraw a small volume of air from the vial into the syringe to create a slight negative pressure inside the vial
- slowly inject a **small** volume of diluent into the vial equal to the amount of air withdrawn from the vial
 - ✗ do **NOT** inject all the diluent at once

- ✖ do **NOT** create positive pressure inside the vial
- continue alternately withdrawing air and injecting diluent (milking technique)
 - ✖ do **NOT** create excess negative pressure inside the vial throughout the reconstitution process
- keep the bevel of the needle above the fluid level in the vial
- once all the diluent has been added, withdraw **slightly** more air into the syringe than the volume of diluent added to create a **slight** negative pressure in the vial
- if reconstituting hazardous drug (HD), the HD-contaminated air may be left in the syringe or injected into an empty sterile vial or an empty VIAFLEX® bag
- remove the needle from the vial and safely recap
 - ✖ do **NOT** eject the HD-contaminated air into the needle cap as this causes HD aerosols / vapours to be released into the biological safety cabinet environment
- repeat with the remaining diluent syringe(s) using the same technique until the total volume of diluent is injected into the vial
 - ✖ do not insert the needle from subsequent syringe(s) into the vial stopper at the same point of entry as previous needles
- disinfect the vial stopper using a sterile 70% IPA swab
- gently agitate the vial (if appropriate for specific drug)
- inspect the solution for undissolved drug and particulate (see Checking for Particulate in Vials, Syringes, and Final Products)
- write the reconstitution date **and** time directly on the accessed vial
- repeat with remaining syringes and vials (if reconstituting drug in more than one vial)
- take photo(s) of the vial(s) for the final product check (if using PharmacyKeeper for the final product check)
 - ✓ if PharmacyKeeper cannot be used for the final product check, then the final product check must be completed via direct observation

Note:

- ✓ Always ensure the drug is completely dissolved and particle free before withdrawing a dose or storing for future use
- **USE ASEPTIC TECHNIQUE THROUGHOUT**

Withdrawal of Hazardous Drug Solution from a Vial Using ChemoLock™

ACTIVITY/STANDARD

- insert an appropriately sized ChemoLock Vial Spike™ into a hazardous drug (HD) vial stopper (see Attaching a ChemoLock™ Vial Spike to a Hazardous Drug Vial)
- select syringe(s) of appropriate size for the total calculated volume of HD to be withdrawn
 - ✓ an appropriate size syringe must be selected so that no more than three-quarters (75%) of the syringe's maximum calibrated volume is filled with hazardous drug solution at any time during the compounding process
- luer lock a ChemoLock™ Injector onto the syringe tip(s)
 - ✓ rotate the Injector onto the syringe until an audible click is heard and it spins freely
 - ✗ do NOT add air to a syringe prior to attaching a ChemoLock™ Injector
- grasping the ChemoLock™ Port on the Vial Spike and the ChemoLock™ Injector attached to a syringe, push the two pieces straight together until an audible click is heard
 - ✗ do NOT hold onto the release clips on the Injector when connecting the Injector to the Port on the Vial Spike
- invert the syringe/vial unit and position the so the graduates on the syringe are visible
- withdraw about half the required volume of hazardous drug into the syringe
 - air enters the vial through the one-way hydrophobic filter while drug is withdrawn equalizing the pressure in the vial
 - a 'milking' technique is NOT necessary
- collect the small amount of air bubbles at the top of the syringe by tapping on the syringe barrel just below the bubbles and expel back into the vial
 - air injected into the vial will be expelled into the balloon causing the balloon to inflate as the pressure in the vial equalizes
 - balloon capacity of 20 mm & 28 mm Vial Spikes = 100 mL; balloon capacity of 13 mm Vial Spike = 20 mL
- draw the plunger back slowly to, NOT past, the final desired volume of drug
- place the vial in an upright position on the work surface of the biological safety cabinet
- remove the Injector/syringe from the Vial Spike:
 - ✓ squeeze the release clips on the ChemoLock™ Injector
 - the ChemoLock™ Injector will automatically disconnect; do NOT pull apart when releasing
- repeat with remaining syringe(s) if applicable
- inspect the solution in the syringe(s) for particulate (see Checking for Particulate in Vials, Syringes, and Final Products)
- if not dispensing the syringe(s) to the administration unit, write the drug name on the syringe barrel(s) using a thin-tipped permanent marker
- take photo(s) of the drug-filled syringe(s) for the final product check (if using PharmacyKeeper for the final product check)
- write the puncture date and time directly on the accessed vial
- take photo(s) of the vial(s) for the final product check (if using PharmacyKeeper for the final product check)

Note:

- ✓ do NOT remove the ChemoLock™ Injector from any hazardous drug syringe as this will open the system and increase the chance of exposing healthcare workers to hazardous drug
 - ✓ if PharmacyKeeper cannot be used for the final product check, then the final product check must be completed via direct observation
- USE ASEPTIC TECHNIQUE THROUGHOUT

Withdrawal of Drug Solution from a Vial Using a Chemotherapy Dispensing Pin

ACTIVITY/STANDARD

- ensure the correct drug vial has been selected
- remove the protective cap from the vial stopper and dispose of it into a hazardous waste container inside the biological safety cabinet (BSC)
- with the vial in an upright position on the work surface, disinfect the vial stopper with a sterile 70% isopropyl alcohol (IPA) swab
 - ✓ wipe the vial stopper several (e.g., three) times in one direction
 - ✓ use a new alcohol swab to disinfect each critical site
- allow the alcohol to dry
- carefully remove the protective cover from the spike on the chemotherapy dispensing pin and dispose of it into a hazardous waste container inside the BSC
- holding the support flange / edge of the filter cover (depending on the type of chemotherapy dispensing pin used), firmly push the spike straight into the centre of the vial stopper
- inspect the solution in the accessed vial for particulate (see Checking for Particulate in Vials, Syringes, and Final Products)
- select syringe(s) of appropriate size for the total calculated volume of drug to be withdrawn
 - ✓ if withdrawing hazardous drug, an appropriate size syringe must be selected so that no more than three-quarters (75%) of the syringe's maximum calibrated volume is filled with hazardous drug solution at any time during the compounding process
- remove the intermittent stopper cap from the access port of the chemotherapy dispensing pin and place on a 70% IPA swab to the side of the work area or dispose of it if the critical site-side is touch contaminated
- luer-lock the syringe onto the exposed access port of the chemotherapy dispensing pin
- invert the syringe/vial unit and position so the graduates on the syringe are visible
 - if using a BRAUN CHEMO DISPENSING PIN®:
 - ✓ maintain a path of first air to the dispensing pin filter during withdrawal
- withdraw about half of the required volume of drug into the syringe
 - air enters the vial through the hydrophobic filter while drug is withdrawn equalizing the pressure in the vial
 - a 'milking' technique is NOT necessary
- collect the air bubbles at the top of the syringe by tapping on the syringe barrel just below the bubbles and expel back into the vial
 - pulling back on the syringe plunger to withdraw more drug will clear any fluid that may be on the filter surface after expelling the air back into the vial
 - failure to clear the fluid by aspiration may result in build-up of fluid on the filter surface, blocking the chemotherapy dispensing pin filter and possibly creating a spill
- draw the plunger back slowly to, NOT past, the final desired volume of drug
- place the vial in an upright position on the work surface of the BSC
- carefully detach the drug-filled syringe from the luer-lock access port of the chemotherapy dispensing pin and cover the syringe tip by either:
 - attaching a needle to inject the drug into an intravenous (IV) solution bag; or
 - attaching the syringe to an infusion device; or
 - attaching a syringe tip cap (luer lock or non-luer lock) until ready to inject the contents into a final container; or
 - attaching a luer lock syringe tip for dispensing to the nursing unit
- as soon as the syringe has been detached and the syringe tip covered, re-attach the intermittent stopper cap or a luer-lock tip cap to the access port of the chemotherapy dispensing pin (even if all drug was removed from the vial)
- repeat with remaining syringe(s) if applicable

- inspect the solution in the syringe(s) for particulate (see Checking for Particulate in Vials, Syringes, and Final Products)
- if not dispensing the syringe(s) to the administration unit, write the drug name on the syringe barrel(s) using a thin-tipped permanent marker
- take photo(s) of the drug-filled syringe(s) for the final product check (if using PharmacyKeeper for the final product check)
- write the puncture date **and** time directly on the accessed vial
- take photo(s) of the vial(s) for the final product check (if using PharmacyKeeper for the final product check)

Note:

- the chemotherapy dispensing pin should remain in the vial and be disposed of with the vial
 - use one chemotherapy dispensing pin per drug vial
 - do not withdraw drug from a vial that has a chemotherapy dispensing pin inserted once the vial has been removed from the BSC even if the vial is placed back into the BSC prior to the next withdrawal
 - ✓ if PharmacyKeeper cannot be used for the final product check, then the final product check must be completed via direct observation, not by marking syringes
- **USE ASEPTIC TECHNIQUE THROUGHOUT**

Withdrawal of Drug Solution from a Vial Using a Chemotherapy Vent

ACTIVITY/STANDARD

- ensure the correct drug vial has been selected
- remove the protective cap from the vial stopper and dispose of it into a hazardous waste container inside the biological safety cabinet (BSC)
- with the vial in an upright position on the work surface, disinfect the vial stopper using a sterile 70% isopropyl alcohol (IPA) swab
 - ✓ wipe the vial stopper several (e.g., three) times in one direction
 - ✓ use a new alcohol swab to disinfect each critical site
- allow the alcohol to dry
- carefully remove the cap from the needle of the chemotherapy vent and dispose of it into a hazardous waste container inside the BSC
- holding the support flange of the , insert the needle into the outer edge of the vial stopper
- ensure the bevel of the needle remains low in the vial (closer to the bottom of the vial)
- inspect the solution in the accessed vial for particulate (see Checking for Particulate in Vials, Syringes, and Final Products)
- select syringe(s) of appropriate size for the total calculated volume of drug to be withdrawn and attach needle(s) of appropriate gauge
 - ✓ if withdrawing hazardous drug, an appropriate size syringe must be selected so that no more than three-quarters (75%) of the syringe's maximum calibrated volume is filled with hazardous drug solution at any time during the compounding process
- remove the needle cap from the needle attached to a syringe and place on a 70% IPA swab or into a needle cap holder to the side of the work area
- insert the needle into the centre of the vial stopper so that its bevel is positioned higher inside the vial than the bevel of the chemotherapy vent needle (closer to the vial stopper)
- invert the syringe/vial unit and position so the graduates on the syringe are visible
 - ✓ maintain a path of first air to the chemotherapy vent filter during withdrawal of solution
- withdraw about half of the required volume of drug into the syringe
 - air enters the vial through the hydrophobic filter while drug is withdrawn equalizing pressure in the vial
 - a 'milking' technique is NOT necessary
- collect the air bubbles at the top of the syringe by tapping on the syringe barrel just below the bubbles and expel back into the vial
 - ✓ ensure the bevel of the chemotherapy vent needle is NOT in solution prior to expelling air bubbles into the vial or solution will be forced into the chemotherapy vent and possibly plug the filter
- draw the plunger back slowly to, NOT past, final desired volume of drug
- place the vial in an upright position on the work surface of the BSC
- remove the needle from the vial and safely recap
- repeat with remaining syringe(s) if applicable
- inspect the solution in the syringe(s) for particulate (see Checking for Particulate in Vials, Syringes, and Final Products)
- if not dispensing the syringe(s) to the administration unit, write the drug name on the syringe barrel using a thin-tipped permanent marker
- take photo(s) of the drug-filled syringe(s) for the final product check (if using PharmacyKeeper for the final product check)
- the chemotherapy vent may remain in the vial for withdrawal of more drug as long as the vial remains in the BSC and a path of first air is maintained to the vial, or the vent may be transferred to another vial of the SAME drug for the SAME patient

- write the puncture date **and** time directly on the accessed vial
- take photo(s) of the vial(s) for the final product check (if using PharmacyKeeper for the final product check)
- the chemotherapy vent **must** be carefully removed from the vial before removing the vial from the BSC
 - ✘ **do NOT recap the needle** of the chemotherapy vent prior to disposing of it into the sharps container
 - ✓ disinfect the vial stopper using a sterile 70% IPA swab and allow the alcohol to dry

Note:

- ✓ if PharmacyKeeper cannot be used for the final product check, then the final product check must be completed via direct observation

If the filter of the chemotherapy vent becomes wet and plugged, equalization of pressure inside the vial will not occur. A new chemotherapy vent must be inserted into the vial stopper PRIOR to removal of the plugged vent.

- obtain a new chemotherapy vent
- insert the needle of the chemotherapy vent and the needle attached to the syringe further into the vial
- disinfect the vial stopper around the needles using a sterile 70% IPA swab and allow the alcohol to dry
- remove the cap from the needle of the new chemotherapy vent and dispose of it into a hazardous waste container inside the BSC
- insert the new chemotherapy vent needle into the vial to equalize the pressure and **THEN** remove the plugged chemotherapy vent and the needle attached to the syringe
 - ✘ **do NOT recap the needle** of the chemotherapy vent prior to disposing of it into the sharps container
- **USE ASEPTIC TECHNIQUE THROUGHOUT**

Withdrawal of Drug Solution from a Vial Using Negative Pressure Technique

ACTIVITY/STANDARD

Negative pressure technique must NOT be used for withdrawal of hazardous drug (HD) if filter venting or closed system drug transfer devices are available. If negative pressure must be used (e.g., when preparing a clinical trials drug), care must be taken. Build-up of positive pressure within the vial will cause back spray of HD solution when the needle is removed. Excess negative pressure will result in spillage from the bevel of the needle when it is removed from the HD vial.

- ensure the correct drug vial has been selected
- remove the protective cap from the vial stopper and dispose of it into a hazardous waste container inside the biological safety cabinet (BSC)
- with the vial in an upright position on the work surface, disinfect the vial stopper using a sterile 70% isopropyl alcohol (IPA) swab
 - ✓ wipe the vial stopper several (e.g., three) times in one direction
 - ✓ use a new alcohol swab to disinfect each critical site
- allow the alcohol to dry
- select syringe(s) of appropriate size for the total calculated volume of drug to be withdrawn and attach needle(s) of appropriate gauge
 - ✓ if withdrawing hazardous drug, an appropriate size syringe must be selected so that no more than three-quarters (75%) of the syringe's maximum calibrated volume is filled with hazardous drug solution at any time during the compounding process
- draw a volume of air into the syringe **slightly** less than the volume of drug solution to be withdrawn from the vial
- remove the needle cap from the needle attached to a syringe and place on a 70% IPA swab or into a needle cap holder to the side of the work area
- insert the needle into the centre of the vial stopper
- invert the syringe/vial unit and position so the graduates on the syringe are visible
- **first** withdraw a **small** volume of drug into the syringe to create a slight negative pressure inside the vial
- slowly inject a **small** volume of air into the vial equal to the volume of drug withdrawn from the vial
 - ✗ do **NOT** inject all the air at once
 - ✗ do **NOT** create positive pressure inside the vial
- continue alternately withdrawing drug and injecting air (milking technique)
 - ✗ do **NOT** create excess negative pressure inside the vial throughout the withdrawal process
- collect the air bubbles at the top of the syringe by tapping on the syringe barrel just below the bubbles and expel back into the vial
 - ✗ do not remove the needle from the vial to remove the air
- draw the syringe plunger back slowly to, NOT past, the final desired volume of drug
- place the vial in an upright position on the work surface of the BSC
- remove the needle from the vial and safely recap
- repeat with remaining syringe(s) if applicable
- inspect the solution in the syringe(s) for particulate (see Checking for Particulate in Vials, Syringes, and Final Products)
- if not dispensing the syringe(s) to the administration unit, write the drug name on the syringe barrel(s) using a thin-tipped permanent marker
- take photo(s) of the drug-filled syringe(s) for the final product check (if using PharmacyKeeper for the final product check)
- disinfect the vial stopper using a sterile 70% IPA swab and allow the alcohol to dry
- write the puncture date **and** time directly on the accessed vial
- take photo(s) of the vial(s) for the final product check (if using PharmacyKeeper for the final product check)

Note:

- ✓ if PharmacyKeeper cannot be used for the final product check, then the final product check must be completed via direct observation

See Safely Capping Needles Used with Hazardous Drugs

- **USE ASEPTIC TECHNIQUE THROUGHOUT**

Checking for Particulate in Vials, Syringes, and Final Products

ACTIVITY/STANDARD

Vials

- to inspect the contents of a vial for particulate:
 - ✓ position the vial upright and swirl the contents while looking for particulate
 - ✓ turn the vial upside down and swirl the contents while looking again for particulate
 - ✓ bubbles will slowly float around and upwards; particulate will slowly float around and downwards inside the vial
- if particulate is present in the vial:
 - ✓ check the BC Cancer Drug Filtering Chart to see if the drug can be filtered (see 'Exception' below)
 - ✓ if the drug can be filtered, filter the solution during withdrawal from the vial (see Filtering Particulate from [Hazardous Drug] Solution)
 - ✓ if residual drug is left in the vial once the total dose has been withdrawn:
 - use a thin-tipped permanent marker to write 'FILTER' directly on the vial
 - ✗ if the drug can **NOT** be filtered, the drug vial must be wasted and a new vial used to complete the preparation

Syringes

- after withdrawal of solution from a vial, inspect the solution-filled syringe for particulate (even if the solution was filtered during withdrawal from the vial)
- to inspect solution in a syringe for particulate:
 - ✓ rotate the syringe upside down and upright while looking for particulate
 - ✓ bubbles will slowly float around and upwards; particulate will slowly float around and downwards inside the vial
- if particulate is present in a syringe:
 - ✓ check The BC Cancer Drug Filtering Chart to see if the drug can be filtered (see 'Exception' below)
 - ✓ if the drug can be filtered:
 - ✓ filter the solution into a new syringe (see Filtering Particulate from [Hazardous Drug] Solution)
 - ✓ inspect the new syringe for particulate and re-filter if particulate is present
 - ✗ if the drug can **NOT** be filtered, the syringe and its contents must be wasted and a new syringe used to draw up the required volume of drug for the preparation
- if particulate is not present in the syringe:
 - if the syringe is the final product:
 - ✓ attach a luer lock tip cap for dispensing
 - or
 - ✓ leave the ChemoLock™ Injector attached to the syringe for dispensing
 - if the syringe is not the final product:
 - ✓ inject solution in the syringe into a final container

Final products (Intravenous solution bags, Infusors™, etc.)

- inspect final products for particulate (if the drug will NOT be filtered during administration)
- to inspect solution in a final product for particulate:
 - ✓ rotate the final product upside down and upright while looking for particulate
 - ✓ bubbles will float slowly around and upwards; particulate will slowly float around and downwards inside the final product
- if particulate is present and the drug will NOT be filtered during administration, the final product will be wasted and a new preparation made (see 'Exception' below)

Exception

- Certain drugs may contain a small amount of easily visible, white, amorphous particulates (e.g., cetuximab). Refer to the Chemotherapy Preparation and Stability chart to determine if white particulate may be expected. If small white particulates are identified and expected in a preparation, it may be dispensed as it will be administered to the patient using an in-line filter.
- **USE ASEPTIC TECHNIQUE THROUGHOUT**

Filtering Particulate from Solution in Vials and Syringes Using a 5 Micron Hydrophilic Filter Disc and a Chemotherapy Vent

ACTIVITY/STANDARD

If particulate is present and not expected, check the BC Cancer Drug Filtering Chart to see if the drug can be filtered. If the drug can be filtered:

- with the vial in an upright position on the work surface, disinfect the vial stopper using a sterile 70% isopropyl alcohol (IPA) swab
 - ✓ wipe the vial stopper several (e.g., three) times in one direction
 - ✓ use a new alcohol swab to disinfect each critical site
- allow the alcohol to dry
- carefully remove the cap from the needle of a chemotherapy vent and dispose of it into a hazardous waste container inside the biological safety cabinet (BSC)
- holding the support flange of the chemotherapy vent, insert the needle into the outer edge of the vial stopper
- ensure the bevel of the chemotherapy vent needle remains low in the vial (closer to the bottom of the vial)

Filtering particulate found in a vial using a 5 micron hydrophilic filter disc

- luer lock a 5 micron hydrophilic filter disc to a syringe of appropriate size for the total calculated volume of drug to be filtered
- luer lock an appropriately sized needle to the other side of the filter disc
- insert the needle attached to the filter disc into the centre of the vial stopper so that its bevel is positioned higher inside the vial than the bevel of the chemotherapy vent needle (closer to the vial stopper)
- invert the syringe / vial / filter disc / needle assembly and position so the graduates on the syringe are visible
 - ✓ maintain a path of first air to the chemotherapy vent filter during withdrawal of solution
- withdraw about half of the required volume of drug into the syringe
- collect air bubbles at the top of the syringe by tapping on the syringe barrel just below the bubbles and expel back into the vial
 - ✓ ensure the bevel of the chemotherapy vent needle is NOT in solution prior to expelling air bubbles into the vial or solution will be forced into the chemotherapy vent and possibly plug the filter
- draw the plunger back **slowly** to, but not past the final desired volume of drug
- place the vial back onto the work surface of the BSC
- remove the needle attached to the hydrophilic filter disc from the vial and safely recap
- inspect the drug in the syringe for particulate (see Checking for Particulate in Vials, Syringes, and Final Products)
- write the drug name on the syringe barrel using a thin-tipped permanent marker and take photo(s) of the drug-filled syringe for the final product check (if using PharmacyKeeper for the final product check)
 - ✓ if PharmacyKeeper cannot be used for the final product check, then the syringe volume check must be completed via direct observation, not by marking syringes
- repeat with remaining syringe(s)
- attach a NEW filter disc and needle to each new syringe
- remove the needle / filter disc assembly from the syringe and dispose of it into the sharps container
- luer lock an appropriately sized needle onto each syringe and inject the solution into a final container
or
- ready the syringe(s) for dispensing to the nursing unit (see Removal and/or Disposal of Used Supplies and the Final Product from the Biological Safety Cabinet)
- take a photo of the labelled final product for the final product check (if using PharmacyKeeper for the final product check)
 - ✓ If PharmacyKeeper cannot be used for the final product check, then the final product check must be completed via direct observation

Filtering particulate found in a vial using a 5 micron hydrophilic filter needle

- luer lock a 5 micron hydrophilic filter needle to a syringe of appropriate size for the total calculated volume of drug to be filtered
- insert the filter needle into the centre of the vial stopper so that its bevel is positioned higher inside the vial than the bevel of the chemotherapy vent needle (closer to the vial stopper)
- invert the vial / syringe / filter needle assembly and position so the graduates on the syringe are visible
 - ✓ maintain a path of first air to the chemotherapy vent filter during withdrawal of solution
- withdraw about half of the required volume of drug into the syringe
- collect air bubbles at the top of the syringe by tapping on the syringe barrel just below the bubbles and expel back into the vial
 - ✓ ensure the bevel of the chemotherapy vent needle is NOT in solution prior to expelling air bubbles into the vial or solution will be forced into the chemotherapy vent and possibly plug the filter
- draw the plunger back **slowly** to, but not past the final desired volume of drug
- place the vial back onto the work surface of the BSC
- remove the hydrophilic filter needle from the vial and safely recap
- inspect the drug in the syringe for particulate (see Checking for Particulate in Vials, Syringes, and Final Products)
- write the drug name on the syringe barrel using a thin-tipped permanent marker and take photo(s) of the drug-filled syringe for the final product check (if using PharmacyKeeper for the final product check)
 - ✓ if PharmacyKeeper cannot be used for the final product check, then the syringe volume check must be completed via direct observation, not by marking syringes
- repeat with remaining syringe(s)
- attach a NEW filter needle to each new syringe
- remove the filter needle from the syringe and dispose of it into the sharps container
- luer lock an appropriately sized needle onto each syringe and inject the solution into a final container
or
- ready the syringe(s) for dispensing to the nursing unit (see Removal and/or Disposal of Used Supplies and the Final Product from the Biological Safety Cabinet)
- take a photo of the labelled final product for the final product check (if using PharmacyKeeper for the final product check)
 - ✓ If PharmacyKeeper cannot be used for the final product check, then the final product check must be completed via direct observation
- **USE ASEPTIC TECHNIQUE THROUGHOUT**

Filtering Particulate from Solution in a Syringe Using a 5 Micron Hydrophilic Filter Needle

ACTIVITY/STANDARD

If particulate is present and not expected, check the BC Cancer Drug Filtering Chart to see if the drug can be filtered. If the drug can be filtered either:

- luer lock a 5 micron hydrophilic filter needle to the hazardous drug-filled syringe containing particulate
- inject the drug solution into an intravenous (IV) solution bag (final container)
- inspect the solution in the final container for particulate (see Checking for Particulate in Vials, Syringes, and Final Products)
or
- luer lock a 5 micron hydrophilic filter disc to the hazardous drug-filled syringe containing particulate
- luer lock the hydrophilic filter disc to a final container (e.g., Infusor™)
- push the drug solution through the filter disc into the final container
- remove the filter disc from the final container
- inspect the solution in the final container for particulate (see Checking for Particulate in Vials, Syringes, and Final Products)
or
- luer lock a 5 micron hydrophilic filter disc to the hazardous drug-filled syringe containing particulate
- luer lock a syringe fluid dispensing / syringe tip connector to the distal end of the 5 micron hydrophilic filter disc
- luer lock a new syringe to the distal end of the syringe fluid dispensing / syringe tip connector
- push the drug solution through the filter disc/syringe fluid dispensing / syringe tip connector into the new syringe
- inspect the solution in the final container for particulate (see Checking for Particulate in Vials, Syringes, and Final Products and Removal and/or Disposal of Used Supplies and the Final Product from the Biological Safety Cabinet)
- **USE ASEPTIC TECHNIQUE THROUGHOUT**

Filtering Particulate from Hazardous Drug Solution in a Vial Using ChemoLock™

ACTIVITY/STANDARD

If particulate is present and not expected, check the BC Cancer Drug Filtering Chart to see if the drug can be filtered. If the drug can be filtered using a 5 micron filter:

- select syringe(s) of appropriate size for the total calculated volume of hazardous drug (HD) to be withdrawn from the vial
 - ✓ an appropriate size syringe must be selected so that no more than three-quarters (75%) of the syringe's maximum calibrated volume is filled with hazardous drug solution at any time during the compounding process
- luer lock a ChemoLock™ Injector onto the syringe tip(s)
 - ✓ rotate the Injector onto the syringe until an audible click is heard and it spins freely
 - ✗ do NOT add air to the syringe prior to attaching a ChemoLock™ Injector
- luer lock a ChemoLock™ Port to one end of a 5 micron hydrophilic filter disc
- luer lock a ChemoLock™ Injector to the other end of the same 5 micron hydrophilic filter disc
 - ✓ rotate the Injector onto the filter disc until an audible click is heard and it spins freely
- grasping the ChemoLock™ Port on the Vial Spike and the ChemoLock™ Injector attached to the filter disc, push the two pieces straight together until an audible click is heard
- grasping the ChemoLock™ Port attached to the filter disc the ChemoLock™ Injector attached to a syringe, push the two pieces straight together until an audible click is heard
- invert the syringe/vial unit and position so the graduates on the syringe are visible
- withdraw the calculated volume of hazardous drug into the syringe
- leave the Injector / filter / ChemoLock™ Port assembly attached to the Vial Spike on the vial for future use
- remove the Injector/syringe from the ChemoLock™ Port attached to the filter disc
 - ✓ squeeze the release clips on the ChemoLock™ Injector
 - the ChemoLock™ Injector will automatically disconnect; do NOT pull apart when releasing
- repeat with remaining syringe(s) if applicable
- inspect the drug in the syringe(s) for particulate (see Checking for Particulate in Vials, Syringes, and Final Products)
- luer lock an appropriately sized needle onto each syringe and inject the solution into a final container
or
- ready the syringe(s) for dispensing to the nursing unit (see Removal and/or Disposal of Used Supplies and the Final Product from the Biological Safety Cabinet)
- **take a photo of the labelled final product for the final product check (if using PharmacyKeeper for the final product check)**
 - ✓ **If PharmacyKeeper cannot be used for the final product check, then the final product check must be completed via direct observation**

Note:

- ✗ do NOT remove the ChemoLock™ Injector from any syringe used to measure hazardous drug as this will open the system and increase the chance of exposing healthcare workers to hazardous drug

See Diagrams of Connections When Filtering Particulate Found in a Syringe and a Vial Using ChemoLock™

- **USE ASEPTIC TECHNIQUE THROUGHOUT**

Filtering Particulate from Hazardous Drug Solution in Syringes Using ChemoLock™

ACTIVITY/STANDARD

If particulate is present and not expected, check the BC Cancer Drug Filtering Chart to see if the drug can be filtered. If the drug can be filtered using a 5 micron filter, filter the solution during injection into a final container

- luer lock a ChemoLock™ Port to one end of a 5 micron hydrophilic filter disc
- luer lock a ChemoLock™ Injector to the other end of the same 5 micron hydrophilic filter disc
 - ✓ rotate the Injector onto the filter disc until an audible click is heard and it spins freely
- grasping the ChemoLock™ Port attached to the filter disc and the ChemoLock™ Injector attached to the solution-filled syringe, push the two pieces straight together until an audible click is heard
- grasping the ChemoLock™ Port attached to the final container (e.g., on the Bag Spike, or Infusor™) and the ChemoLock™ Injector attached to the filter disc / syringe, push the two pieces straight together until an audible click is heard
- slowly inject the drug into the final container
- repeat with remaining syringe(s) if applicable
 - ✓ leave the Injector / filter / ChemoLock™ Port assembly attached to the ChemoLock™ Port on the final container
 - ✓ remove the Injector/syringe from the ChemoLock™ Port attached to the filter disc
 - ✓ squeeze the release clips on the ChemoLock™ Injector attached to the emptied syringe
 - the ChemoLock™ Injector will automatically disconnect; do NOT pull apart when releasing
 - ✓ attach the next drug-filled syringe to the ChemoLock™ Port on the filter disc and inject the drug into the final container (if applicable)
- once all drug has been injected into the final container:
 - ✓ remove the Injector/filter disc from the ChemoLock™ Port attached to the final container
 - ✓ squeeze the release clips on the ChemoLock™ Injector attached to the filter disc
 - the ChemoLock™ Injector will automatically disconnect; do NOT pull apart when releasing
- check the final container for leaks and inspect the solution for particulate (see Checking for Particulate in Vials, Syringes, and Final Products)
- ready the final container for removal from the BSC for dispensing (see Removal and/or Disposal of Used Supplies and the Final Product from the Biological Safety Cabinet)

Filtering solution from a syringe that contains particulate into an empty syringe (when the final container is a syringe)

- luer lock a ChemoLock™ Port to one end of a 5 micron hydrophilic filter disc
- luer lock a syringe fluid dispensing / syringe tip connector to the distal end of the same 5 micron hydrophilic filter disc
- luer lock a ChemoLock™ Port to the other end of the fluid dispensing / syringe tip connector
- luer lock a ChemoLock™ Injector to a sterile syringe that contains about 5 mL of air
 - ✓ rotate the Injector onto the syringe until an audible click is heard and it spins freely
- grasping the ChemoLock™ Port attached to the syringe fluid dispensing / syringe tip connector and the ChemoLock™ Injector attached to the syringe containing 5 mL of air, push the two pieces straight together until an audible click is heard
- grasping the ChemoLock™ Port attached to the other end of the hydrophilic filter disc and the ChemoLock™ Injector attached to the solution-filled syringe, push the two pieces straight together until an audible click is heard
- FIRST transfer the 5 mL of air into the drug-filled syringe, then transfer the drug into the empty syringe, while filtering the solution
- double-check the volume to ensure no drug was lost during the transfer; adjust the volume if necessary, drawing all the drug through the transfer system
- remove the Injector/drug-filled syringe from the ChemoLock™ Port attached to the syringe fluid dispensing / syringe tip connector
 - ✓ squeeze the release clips on the ChemoLock™ Injector attached to the drug-filled syringe

- the ChemoLock™ Injector will automatically disconnect; do NOT pull apart when releasing
- dispose of the emptied syringe still attached to the fluid dispensing / syringe tip connector / hydrophilic filter disc into a hazardous waste container inside the BSC
- inspect the drug in the syringe for particulate (see Checking for Particulate in Vials, Syringes, and Final Products)
- luer lock an appropriately sized needle onto each syringe and inject the solution into a final container
or
- ready the syringe(s) for dispensing to the nursing unit (see Removal and/or Disposal of Used Supplies and the Final Product from the Biological Safety Cabinet)
- take a photo of the labelled final product for the final product check (if using PharmacyKeeper for the final product check)
 - ✓ If PharmacyKeeper cannot be used for the final product check, then the final product check must be completed via direct observation

See Diagrams of Connections When Filtering Particulate Found in a Syringe and a Vial Using ChemoLock™

- **USE ASEPTIC TECHNIQUE THROUGHOUT**

Diagrams of Connections When Filtering Particulate Found in a Syringe and a Vial Using ChemoLock™

Particulate may be found in either a syringe or a vial containing hazardous drug solution. To filter particulate while maintaining a closed system, follow the setup pictured below for filtration from a syringe or vial. When filtering particulate, use of a 5 micron filter disc is recommended (see Checking for Particulate in Vials, Syringes, and Final Products).

Spinning Injector - Syringe



Spinning Injector – Filter disc – Port



Port – Filter disc – Syringe connector – Port



Filter from a Vial

Vial – Spinning Injector – Filter disc – Port – Spinning Injector – Syringe



Filter during injection into an IV solution bag

IV Solution Bag – Spinning Injector – Filter disc – Port – Spinning Injector - Syringe



Filter from a drug-filled syringe into an empty syringe

Empty Syringe - Spinning Injector - Port - Filter Connector - Syringe - Port - Spinning Injector - Drug-filled syringe



Note:

- Do NOT remove the ChemoLock™ Injector from any syringe used to measure hazardous drug as this will open the system and increase the chance of exposing healthcare workers to hazardous drug

Injection of Hazardous Drug Solution into an Intravenous Solution Bag Using ChemoLock™

ACTIVITY/STANDARD

- ensure the correct intravenous (IV) solution bag has been selected
 - squeeze the IV solution bag to check for leaks
 - remove the protective cover from the administration port of the IV solution bag
 - remove the protective cover from the spike on the ChemoLock™ Bag Spike
 - insert the spike firmly into the administration port of the IV solution bag up to the shoulder on the Bag Spike
 - check the IV solution bag for leaks and inspect the solution for particulate (see Checking for Particulate in Vials, Syringes, and Final Products)
 - verify the correct volume of drug for the dose is contained in the syringe(s)
 - inspect the solution in the syringe(s) for particulate and filter the particulate out of the solution (if present) (see Filtering Particulate from Hazardous Drug Solution in Syringes Using ChemoLock™)
 - write the drug name on the syringe barrel(s) using a thin-tipped permanent marker and take photo(s) of the drug-filled syringe(s) for the final product check (if using PharmacyKeeper for the final product check)
 - ✓ if PharmacyKeeper cannot be used for the final product check, then the syringe volume check must be completed via direct observation, not by marking syringes
 - attach the Injector (attached to a hazardous drug-filled syringe) to the Port on the Bag Spike
 - ✓ grasping the Port on the ChemoLock™ Bag Spike and the ChemoLock™ Injector attached to the drug-filled syringe, push the two pieces straight together until an audible click is heard
 - ✗ do NOT hold onto the release clips on the Injector when connecting the Injector to the Port on the Bag Spike
 - inject the drug
 - remove the Injector/ syringe from the Port on the ChemoLock™ Bag Spike
 - ✓ squeeze the release clips on the ChemoLock™ Injector attached to the syringe
 - the ChemoLock™ Injector will automatically disconnect; do NOT pull apart when releasing
 - add drug from remaining syringe(s) if applicable
 - check the IV solution bag for leaks and inspect the solution for particulate (see Checking for Particulate in Vials, Syringes, and Final Products)
 - ready the IV solution bag for removal from the BSC for dispensing (see Removal and/or Disposal of Used Supplies and the Final Product from the Biological Safety Cabinet)
 - take a photo of the labelled final product for the final product check (if using PharmacyKeeper for the final product check)
 - ✓ If PharmacyKeeper cannot be used for the final product check, then the final product check must be completed via direct observation
- Note:**
- ✓ do NOT remove the ChemoLock™ Injector from any syringe used to measure hazardous drug as this will open the system and increase the chance of exposing healthcare workers to hazardous drug
- **USE ASEPTIC TECHNIQUE THROUGHOUT**

Flushing a ChemoLock™ Bag Spike that has been used to inject 3 mL or less of drug solution into an Intravenous Solution Bag

ACTIVITY/STANDARD

- luer lock a **new** ChemoLock™ Injector onto a **new** 10 mL syringe
 - ✓ rotate the Injector onto the syringe until an audible click is heard and it spins freely
 - ✗ do NOT add air to a syringe prior to attaching a ChemoLock™ Injector
- grasping the ChemoLock™ Port on the Bag Spike and the ChemoLock™ Injector attached to the syringe, push the two pieces straight together until an audible click is heard
 - ✗ do NOT hold onto the release clips on the Injector when connecting the Injector to the Port on the Bag Spike
- withdraw 3 to 5 mL of solution from the infusion solution bag into the syringe
- invert the infusion solution bag and withdraw 2 mL of air into the syringe
- position the syringe in such a manner that the entire volume of solution is injected back into the infusion solution bag, **followed by** the air
 - if all the air is to be removed from the infusion solution bag, the same flushing syringe can be used for this step. NB- a larger syringe may be required if withdrawing all the air from the infusion solution bag
- write the word “flush” on the syringe and save per site procedures for the final product check
- the final product checker must ensure there is a *flush* syringe that is **separate and distinct** from the syringe(s) used to inject the drug
- **USE ASEPTIC TECHNIQUE THROUGHOUT**

Injection of Drug Solution into an Intravenous Solution Bag Using a Needle and Syringe

ACTIVITY/STANDARD

If ≤ 2 punctures into an IV solution bag port are required when adding drug

- select a needle(s) of appropriate gauge
- attach the needle(s) to a syringe(s) containing drug (if the syringe(s) does not already have a needle attached)
- ensure the correct IV solution bag has been selected
- squeeze the solution bag to check for leaks
- verify the correct volume of drug for the dose is contained in the syringe(s)
- inspect the solution in the syringe(s) for particulate (see Filtering Particulate from Hazardous Drug Solution in Syringes Using ChemoLock™)
- write the drug name on the syringe barrel(s) using a thin-tipped permanent marker and take photo(s) of the drug-filled syringe(s) for the final product check (if using PharmacyKeeper for the final product check)
 - ✓ if PharmacyKeeper cannot be used for the final product check, then the syringe volume check(s) must be completed via direct observation, not by marking syringes
- lay the IV solution bag on the work surface of the biological safety cabinet (BSC)
 - do NOT hang the IV solution bag from the bar in the BSC while injecting drug as this could cause a HD spill when removing the needle from the injection port
- disinfect the injection port of the IV solution bag using a sterile 70% isopropyl alcohol (IPA) swab
 - ✓ wipe the injection port several (e.g., three) times in one direction
 - ✓ use a new alcohol swab to disinfect each critical site
- allow the alcohol to dry
- hold the injection port perpendicular to the airflow so first air is able to flow unobstructed over the point at which the needle will enter the port
- remove the needle cap from the needle and place on a sterile 70% IPA swab or into a needle cap holder to the side of the work area
- place the needle tip onto the centre of the injection port
- exert pressure on the needle tip while rotating the needle straight through both membranes into the bag with the needle shaft parallel to the port walls
- inject the drug
- remove the needle from the IV solution bag port and safely recap the needle
- remove the needle from the syringe, and dispose of the needle into the sharps container
- place a tip cap (luer lock or non-luer lock) onto the syringe tip to protect from leakage / aerosolization of any hazardous drug droplets or aerosols
- repeat for remaining syringe if applicable
- after the solution in the syringe(s) has been injected, wipe the injection port using a 70% IPA swab and allow the alcohol to dry
- gently invert the bag to mix
- squeeze the bag to check for leaks and inspect the solution for particulate (see Checking for Particulate in Vials, Syringes, and Final Products)
- take a photo of the labelled final product for the final product check (if using PharmacyKeeper for the final product check)
 - ✓ If PharmacyKeeper cannot be used for the final product check, then the final product check must be completed via direct observation

If more than two punctures into an IV solution bag port are required when adding drug, see Use of a Winged Infusion Set

See Removal and/or Disposal of Used Supplies and the Final Product from the Biological Safety Cabinet

- **USE ASEPTIC TECHNIQUE THROUGHOUT**

Parenteral Doses Requiring Further Dilution in a Syringe Using ChemoLock™ (e.g., Preparing an Intrathecal Dose)

ACTIVITY/STANDARD

Use a fluid dispensing / syringe tip connector to transfer hazardous drug from one syringe to another **ONLY IF** there is **NOT** a ChemoLock™ Syringe Transfer Set with MicroClave or Double ChemoLock™ available

If preparing an Intrathecal (IT) Dose, always use preservative-free drug and diluent

- attach a ChemoLock™ Vial Spike to the appropriate hazardous drug vial and a spinning ChemoLock™ Injector to a syringe of appropriate size
 - ✓ an appropriate size syringe must be selected so that no more than three-quarters (75%) of the syringe's maximum calibrated volume is filled with hazardous drug solution at any time during the compounding process
- withdraw the calculated volume of hazardous drug (see Withdrawal of Hazardous Drug Solution from a Vial Using ChemoLock™) and **write the drug name on the syringe barrel using a thin-tipped permanent marker**
- select a second appropriately sized syringe large enough to hold the **total** calculated volume of hazardous drug **plus** diluent
- withdraw the calculated volume of diluent into the second syringe
- inspect the solution in the drug- and diluent-filled syringes for particulate (see Checking for Particulate in Vials, Syringes, and Final Products)
- **take photos of the solution-filled syringes for the final product check (if using PharmacyKeeper for the final product check)**
 - ✓ if PharmacyKeeper cannot be used for the final product check, then the syringe volume checks must be completed via direct observation, not by marking syringes
- luer lock a NON-spinning ChemoLock™ Injector to the diluent-filled syringe
- attach one ChemoLock™ Port to each end of a fluid dispensing / syringe tip connector
- disinfect the Ports using a sterile 70% isopropyl alcohol swab
 - ✓ wipe the Port several (e.g., three) times in one direction
 - ✓ use a new alcohol swab to disinfect each critical site
- grasping a ChemoLock™ Port on one end of the fluid dispensing / syringe tip connector and the ChemoLock™ Injector on the diluent-filled syringe, push the two pieces straight together until an audible click is heard
 - ✗ do NOT hold onto the release clips on the Injector when connecting the Injector to the Port
- after disinfecting the ChemoLock™ Port on the other end of the fluid dispensing / syringe tip connector:
 - ✓ grasping the ChemoLock™ Port and the ChemoLock™ Injector on the hazardous drug-filled syringe, push the two pieces straight together until an audible click is heard
 - ✗ do NOT hold onto the release clips on the Injector when connecting the Injector to the Port
- push on the plunger containing the hazardous drug until all the drug has been transferred into the diluent syringe
- disconnect the Injector attached to the emptied drug syringe from the ChemoLock™ Port on the fluid dispensing / syringe tip connector
 - ✓ squeeze the release clips on the ChemoLock™ Injector attached to the emptied drug syringe
 - the ChemoLock™ Injector will automatically disconnect; do NOT pull apart when releasing
- draw ~2 mL of air into a new 3 mL syringe and luer lock a spinning ChemoLock™ Injector to the syringe
 - ✓ continue turning the Injector until an audible click is heard and the Injector spins freely
- grasping a ChemoLock™ Port on the end of the fluid dispensing / syringe tip connector and the ChemoLock™ Injector on the 3 mL syringe, push the two pieces straight together until an audible click is heard
 - ✗ do NOT hold onto the release clips on the Injector when connecting the Injector to the Port
- pull back on the plunger of the drug/diluent syringe to remove the residual hazardous drug from the fluid dispensing / syringe tip connector / Injectors
- gather air bubbles at the tip of the drug/diluent syringe and **slowly** push the air into the Injector (do this step very carefully so as not to expel any drug)

- disconnect the Injectors of each syringe from the ChemoLock™ Ports on the fluid dispensing / syringe tip connector
 - ✓ squeeze the release clips on the ChemoLock™ Injectors attached to the syringes
 - the ChemoLock™ Injectors will automatically disconnect; do NOT pull apart when releasing
 - ✓ ensure that the ChemoLock™ Ports stay attached to each end fluid dispensing / syringe tip connector- do NOT remove as this will open the system and increase the chance of exposing healthcare workers to hazardous drug
- dispose of the fluid dispensing / syringe tip connector attached to the ChemoLock™ Ports into a hazardous waste container inside the BSC
- dispose of the 3 mL syringe into a hazardous waste container inside the BSC
- take a photo of the labelled final product for the final product check (if using PharmacyKeeper for the final product check)
 - ✓ If PharmacyKeeper cannot be used for the final product check, then the final product check must be completed via direct observation
- dispense the hazardous drug-filled syringe with the non-spinning ChemoLock™ Injector attached (see Removal and/or Disposal of Used Supplies and the Final Product from the Biological Safety Cabinet)
- **USE ASEPTIC TECHNIQUE THROUGHOUT**

Parenteral Doses Requiring Further Dilution in a Syringe Using a ChemoLock™ Syringe Transfer Set with MicroClave and ChemoLock™ Port (CL-34) (e.g., Preparing an Intrathecal Dose)

ACTIVITY/STANDARD

If preparing an Intrathecal (IT) Dose, always use preservative-free drug and diluent

- attach a ChemoLock™ Vial Spike to the appropriate hazardous drug vial and a spinning ChemoLock™ Injector to a syringe of appropriate size
 - ✓ an appropriate size syringe must be selected so that no more than three-quarters (75%) of the syringe's maximum calibrated volume is filled with hazardous drug solution at any time during the compounding process
- withdraw the calculated volume of hazardous drug (see Withdrawal of Hazardous Drug Solution from a Vial Using ChemoLock™) and **write the drug name on the syringe barrel using a thin-tipped permanent marker**
- select a second appropriately sized syringe large enough to hold the **total** calculated volume of hazardous drug **plus** diluent and attach a needle
- withdraw the calculated volume of diluent into the second syringe
- inspect the solution in the drug- and diluent-filled syringes for particulate (see Checking for Particulate in Vials, Syringes, and Final Products)
- **take photos of the solution-filled syringes for the final product check (if using PharmacyKeeper for the final product check)**
 - ✓ **if PharmacyKeeper cannot be used for the final product check, then the solution volume checks must be completed via direct observation, not by marking syringes**
- remove the capped needle from the diluent syringe and dispose of it into the sharps container
- luer lock the Clave-end of a ChemoLock™ Syringe Transfer Set with MicroClave and ChemoLock™ Port (Clave Transfer Set) onto the diluent-filled syringe
- disinfect the Port on the other end of the ChemoLock™ Transfer Set using a sterile 70% isopropyl alcohol swab
 - ✓ wipe the Port several (e.g., three) times in one direction
 - ✓ use a new alcohol swab to disinfect each critical site
- grasping the ChemoLock™ Port on the other end of the Clave Transfer Set and the ChemoLock™ Injector on the hazardous drug-filled syringe, push the two pieces straight together until an audible click is heard
 - ✗ do NOT hold onto the release clips on the Injector when connecting the Injector to the Port
- push on the plunger containing the hazardous drug until all the drug has been transferred into the diluent syringe
- disconnect the Injector attached to the emptied drug syringe from the ChemoLock™ Port on the Clave Transfer Set
 - ✓ squeeze the release clips on the ChemoLock™ Injector attached to the emptied drug syringe
 - the ChemoLock™ Injector will automatically disconnect; do NOT pull apart when releasing
- draw ~2 mL of air into a new 3 mL syringe and luer lock a spinning ChemoLock™ Injector to the syringe
 - ✓ continue turning the Injector until an audible click is heard and the Injector spins freely
- grasping the ChemoLock™ Port on the end of the Clave Transfer Set and the ChemoLock™ Injector on the 3 mL syringe, push the two pieces straight together until an audible click is heard
 - ✗ do NOT hold onto the release clips on the Injector when connecting the Injector to the Port
- pull back on the plunger of the drug/diluent syringe to remove the residual hazardous drug from the Clave Transfer Set / Injector
- gather air bubbles at the tip of the drug/diluent syringe and **slowly** push the air into the Clave on the transfer set (do this step very carefully so as not to expel any drug)
- disconnect the Injector attached to the 3 mL syringe from the ChemoLock™ Port on the Clave Transfer Set
 - ✓ squeeze the release clips on the ChemoLock™ Injector attached to the syringe
 - the ChemoLock™ Injector will automatically disconnect; do NOT pull apart when releasing
 - ✓ ensure that the Clave Transfer Set stays attached to the diluted hazardous drug-filled syringe- do NOT remove

- dispose of the 3 mL syringe into a hazardous waste container inside the BSC
- take a photo of the labelled final product for the final product check (if using PharmacyKeeper for the final product check)
 - ✓ If PharmacyKeeper cannot be used for the final product check, then the final product check must be completed via direct observation
- dispense the hazardous drug-filled syringe with the MicroClave Transfer Set attached (see Removal and/or Disposal of Used Supplies and the Final Product from the Biological Safety Cabinet)

Note:

- ✓ do NOT remove the ChemoLock™ Injector from any syringe used to measure hazardous drug as this will open the system and increase the chance of exposing healthcare workers to hazardous drug
- **USE ASEPTIC TECHNIQUE THROUGHOUT**

Parenteral Doses Requiring Further Dilution in a Syringe Using a Chemotherapy Vent (e.g., Preparing an Intrathecal Dose)

ACTIVITY/STANDARD

If preparing an Intrathecal (IT) Dose, always use preservative-free drug and diluent

See Withdrawal of Drug Solution from a Vial Using a Chemotherapy Vent

- attach a needle to a syringe of appropriate size for the total calculated volume of hazardous drug
 - ✓ an appropriate size syringe must be selected so that no more than three-quarters (75%) of the syringe's maximum calibrated volume is filled with hazardous drug solution at any time during the compounding process
- withdraw hazardous drug and recap the needle
 - ✓ write the drug name on the syringe barrel using a thin-tipped permanent marker
- select a second appropriately sized syringe large enough to hold the **total** calculated volume of hazardous drug **plus** diluent and attach a needle
- withdraw the calculated volume of diluent into the second syringe and recap the needle
- inspect the solution in the drug- and diluent-filled syringes for particulate (see Checking for Particulate in Vials, Syringes, and Final Products)
- take photos of the solution-filled syringes for the final product check (if using PharmacyKeeper for the final product check)
 - ✓ if PharmacyKeeper cannot be used for the final product check, then the syringe volume checks must be completed via direct observation, not by marking syringes
- remove the capped needle from the diluent syringe and dispose of it into the sharps container
- luer lock the diluent syringe to one end of a fluid dispensing / syringe tip connector
- remove the capped needle from the hazardous drug-filled syringe and dispose of it into the sharps container
- attach the drug-filled syringe to the other end of the fluid dispensing / syringe tip connector
- holding the syringes containing the drug and diluent, push on the plunger until all the drug is transferred into the diluent syringe
- disconnect the empty drug syringe from the fluid dispensing / syringe tip connector
- attach a non-luer lock or a luer lock syringe tip cap onto the empty hazardous drug syringe
- draw ~0.5 mL of air into a new 3 mL syringe and attach to the fluid dispensing / syringe tip connector
- pull back on the plunger of the drug/diluent syringe to remove the residual hazardous drug from the transfer set
- eliminate air bubbles and **slowly** push solution into the hub of the drug / diluent syringe, but not back into the fluid dispensing / syringe tip connector (do this step very carefully so as not to expel any drug)
- disconnect each syringe from the fluid dispensing / syringe tip connector and dispose of the fluid dispensing / syringe tip connector into the hazardous waste container inside the BSC
- attach a luer lock tip cap onto the drug/diluent-filled syringe for dispensing (see Removal and/or Disposal of Used Supplies and the Final Product from the Biological Safety Cabinet)
- take a photo of the labelled final product for the final product check (if using PharmacyKeeper for the final product check)
 - ✓ If PharmacyKeeper cannot be used for the final product check, then the final product check must be completed via direct observation
- **USE ASEPTIC TECHNIQUE THROUGHOUT**

Transfer of Hazardous Drug From One Syringe to Another Using a ChemoLock™ Syringe Transfer Set with Double ChemoLock™ Ports (CL-33)

ACTIVITY/STANDARD

- luer lock a spinning ChemoLock™ Injector to an appropriately-sized syringe for the total volume of hazardous drug to be transferred from the drug-filled syringe into the new syringe
 - ✓ continue turning the Injector until an audible click is heard and the Injector spins freely
 - ✓ an appropriate size syringe must be selected so that no more than three-quarters (75%) of the syringe's maximum calibrated volume is filled with hazardous drug solution at any time during the compounding process
 - grasping the Port on one end of the ChemoLock™ Syringe Transfer Set with Double ChemoLock™ Ports (ChemoLock™ Transfer Set) and the ChemoLock™ Injector on the drug-filled syringe, push the two pieces straight together until an audible click is heard
 - ✗ do NOT hold onto the release clips on the Injector when connecting the Injector to the Port
 - if first air was blocked during connection, disinfect the Port on the other end of the ChemoLock™ Transfer Set using a sterile 70% isopropyl alcohol swab
 - ✓ wipe the Port several (e.g., three) times in one direction
 - ✓ use a new alcohol swab to disinfect each critical site
 - grasping the disinfected Port on the ChemoLock™ Transfer Set and the ChemoLock™ Injector on the empty syringe, push the two pieces straight together until an audible click is heard
 - ✗ do NOT hold onto the release clips on the Injector when connecting the Injector to the Port
 - transfer the required volume of hazardous drug into the empty syringe
 - disconnect the Injectors of each syringe from the ChemoLock™ Ports on the ChemoLock™ Transfer Set
 - ✓ squeeze the release clips on the ChemoLock™ Injectors attached to the syringes
 - the ChemoLock™ Injectors will automatically disconnect; do NOT pull apart when releasing
 - dispose of the ChemoLock™ Transfer Set into the hazardous waste container inside the BSC
 - save both syringes for the final product check as appropriate
 - write the solution type on the syringe barrel(s) using a thin-tipped permanent marker (if the syringe is not the final product)
 - take photo(s) of the solution-filled syringe(s) for the final product check (if using PharmacyKeeper for the final product check)
 - ✓ if PharmacyKeeper cannot be used for the final product check, then the syringe volume check(s) must be completed via direct observation, not by marking syringes
 - dispense the appropriate hazardous drug syringe with the Injector attached (see Removal and/or Disposal of Used Supplies and the Final Product from the Biological Safety Cabinet)
- Note:**
- ✓ do NOT remove the ChemoLock™ Injector from any syringe used to measure hazardous drug as this will open the system and increase the chance of exposing healthcare workers to hazardous drug
- **USE ASEPTIC TECHNIQUE THROUGHOUT**

Elastomeric Infusor™ Preparation Using ChemoLock™

ACTIVITY/STANDARD

- ensure the correct hazardous drug (HD) vial has been selected and attach an appropriately sized ChemoLock™ Vial Spike (see Attaching a ChemoLock™ Vial Spike to a Hazardous Drug Vial)
- ensure the correct Infusor™ model has been selected
- ensure an appropriately sized bag of diluent has been selected and attach a dispensing pin / universal spike (see Withdrawal of Solution from an Intravenous Solution Bag Using a Dispensing Pin / Universal Spike)
 - when withdrawing diluent from the solution bag, it is not necessary to use ChemoLock™
- select syringe(s) of appropriate size and withdraw the total calculated volume of diluent
- attach a luer lock or non-luer tip cap to the syringe tip(s)
- **write the solution type on the syringe barrel(s) using a thin-tipped permanent marker**
- select syringe(s) of appropriate size for the total calculated volume of HD and luer lock a ChemoLock™ Injector onto each syringe
 - ✓ rotate the Injector onto the syringe(s) until an audible click is heard and the Injector spins freely
 - ✓ do NOT add air to a syringe prior to attaching a ChemoLock™ Injector
 - ✓ an appropriate size syringe must be selected so that no more than three-quarters (75%) of the syringe's maximum calibrated volume is filled with HD at any time during the compounding process
- withdraw the total calculated volume of hazardous drug (see Withdrawal of Hazardous Drug Solution from a Vial Using ChemoLock™) and **write the drug name on the syringe barrel(s) using a thin-tipped permanent marker**
- inspect the solution in the drug- and diluent-filled syringes for particulate (see Checking for Particulate in Vials, Syringes, and Final Products)
- **take photo(s) of the solution-filled syringe(s) for the final product check (if using PharmacyKeeper for the final product check)**
 - ✓ **if PharmacyKeeper cannot be used for the final product check, then the syringe volume checks must be completed via direct observation, not by marking syringes**
- ensure the elastomeric reservoir (balloon) is not twisted - a twisted balloon may rupture during filling
- ensure the winged luer cap is fastened to the distal end of the delivery tubing
- remove the cap from the fill port on top of the Infusor™ and dispose of it into a hazardous waste container inside the biological safety cabinet (BSC)
- grasp the Infusor™ near the top and attach a **diluent**-filled syringe to the fill port; inject the diluent into the Infusor™
 - ✗ do NOT use a needle to inject solution into the fill port as this could damage the fill port
- add the remaining diluent to the Infusor™ (if applicable)
- place the Infusor™ in an upright position on the work surface of the biological safety cabinet
- with the last diluent syringe still attached to the Infusor's™ fill port, prime the tubing with **drug-free** solution
 - ✓ remove the winged luer cap (critical site) from the distal end of the delivery tubing
 - ✓ place the distal end of the tubing above an alcohol swab and visually confirm:
 - i. that the contents of the Infusor™ are flowing through the delivery tubing
 - ii. that the delivery tubing is clear of air and primed to the end of the line **with diluent only**
 - ✓ to check that the Infusor™ is working, **allow three drops of diluent to fall** onto the 70% IPA swab
 - i. if the solution in the Infusor™ is not flowing, **force-prime the Infusor™ before adding drug**
 - ii. if bubbles are in the delivery tubing, **remove the bubbles**
- re-attach the winged luer cap onto the distal end of the delivery tubing- if the winged luer cap has been touch contaminated, attach a new winged luer cap or a luer lock syringe tip cap
- remove the last diluent syringe from the fill port and attach a ChemoLock™ Port to the Infusor™ fill port
- grasping the ChemoLock™ Port on the top of the Infusor™ and the ChemoLock™ Injector attached to one of the HD-filled syringes, push the two pieces straight together until an audible click is heard

- ✘ do **NOT** hold onto the release clips on the Injector when connecting the Injector to the Port on the Infusor™
- inject the HD into the Infusor™
- remove the Injector/syringe from the ChemoLock™ Port
 - ✓ squeeze the release clips on the ChemoLock™ Injector
 - the ChemoLock™ Injector will automatically disconnect, do NOT pull apart when releasing
- repeat with remaining drug-filled syringes if applicable
- check the Infusor™ for leaks and inspect the solution for particulate (see Checking for Particulate in Vials, Syringes, and Final Products)
- leave the ChemoLock™ Port attached to the Infusor's™ fill port for dispensing (see Removal and/or Disposal of Used Supplies and the Final Product from the Biological Safety Cabinet)
- take a photo of the labelled final product for the final product check (if using PharmacyKeeper for the final product check)
 - ✓ If PharmacyKeeper cannot be used for the final product check, then the final product check must be completed via direct observation

Note:

- when adding diluent or HD to the Infusor™, use one of the following methods:
 - i. invert the Infusor™ with the syringe attached, place the syringe plunger end flat on the work surface – grasp the syringe barrel with one hand, use slow, steady downward pressure to fill the balloon while steadying the Infusor™ with the other hand
 - or
 - ii. with the Infusor™ in an upright position, use one hand to hold the syringe barrel while the other hand applies slow steady pressure to the syringe plunger
 - ✘ do **NOT** apply pressure to the connection between the syringe or ChemoLock™ Port and the fill port on the Infusor™ when injecting the diluent
- ✘ do not inject too vigorously creating turbulence in the solution as this may create bubbles
 - small bubbles in the balloon itself will not cause problems; they will gradually dissipate as they move through the filter
 - air in the tubing may stop the flow of solution through the tubing, preventing drug from reaching the patient

Note:

- ✓ do NOT remove the ChemoLock™ Injector from any syringe used to measure hazardous drug as this will open the system and increase the chance of exposing healthcare workers to hazardous drug
- **USE ASEPTIC TECHNIQUE THROUGHOUT**

Elastomeric Infusor™ Preparation NOT Using ChemoLock™

ACTIVITY/STANDARD

- ensure the correct hazardous drug (HD) vial has been selected and attach a chemotherapy dispensing pin or insert a chemotherapy vent (see Withdrawal of Drug Solution from a Vial Using a Chemotherapy Dispensing Pin or Withdrawal of Drug Solution from a Vial Using a Chemotherapy Vent)
- ensure the correct Infusor™ model has been selected
- ensure an appropriately sized bag of diluent has been selected and attach a dispensing pin / universal spike (see Withdrawal of Solution from an Intravenous Solution Bag Using a Dispensing Pin / Universal Spike)
- select syringe(s) of appropriate size and withdraw the total calculated volume of diluent
- attach a luer lock or non-luer lock tip cap to the syringe tip(s)
- **write the solution type on the syringe barrel(s) using a thin-tipped permanent marker**
- select syringe(s) of appropriate size and withdraw the total calculated volume of hazardous drug
 - ✓ an appropriate size syringe must be selected so that no more than three-quarters (75%) of the syringe's maximum calibrated volume is filled with HD at any time during the compounding process
- attach a luer lock or non-luer lock tip cap to the syringe tip(s)
- **write the drug name on the syringe barrel(s) using a thin-tipped permanent marker**
- inspect the solution in the drug- and diluent-filled syringes for particulate (see Checking for Particulate in Vials, Syringes, and Final Products)
- **take photo(s) of the solution-filled syringe(s) for the final product check (if using PharmacyKeeper for the final product check)**
 - ✓ **if PharmacyKeeper cannot be used for the final product check, then the syringe volume checks must be completed via direct observation, not by marking syringes**
- ensure the elastomeric reservoir (balloon) is not twisted - a twisted balloon may rupture during filling
- ensure the winged luer cap is fastened to the distal end of the delivery tubing
- remove the cap from the fill port on top of the Infusor™ and place on a 70% isopropyl alcohol (IPA) swab to the side of the work area
- grasp the Infusor™ near the top and attach a **diluent**-filled syringe to the fill port; inject the diluent into the Infusor™
 - ✗ do **NOT** use a needle to inject solution into the fill port as this could damage the fill port
- add the remaining diluent to the Infusor™ (if applicable)
- place the Infusor™ in an upright position on the work surface of the biological safety cabinet
- with the last diluent syringe still attached to the Infusor's™ fill port, prime the tubing with **drug-free** solution
 - ✓ remove the winged luer cap (critical site) from distal end of the delivery tubing
 - ✓ place the distal end of the tubing above an alcohol swab and visually confirm:
 - i. that the contents of the Infusor™ are flowing through the delivery tubing
 - ii. that the delivery tubing is clear of air and primed to the end of the line **with diluent only**
 - ✓ to check that the Infusor™ is working, **allow three drops of diluent to fall** onto the 70% IPA swab
 - i. if the solution in the Infusor™ is not flowing, **force-prime the Infusor™ before adding drug**
 - ii. if bubbles are in the delivery tubing, **remove the bubbles**
- re-attach the winged luer cap onto the distal end of the delivery tubing- if the winged luer cap has been touch contaminated, attach a new winged luer cap or luer lock syringe tip cap
- remove the last diluent syringe from the fill port and attach a hazardous drug-filled syringe to the Infusor™ fill port
- inject the HD into the Infusor™
- once all the hazardous drug has been added to the Infusor™ and the last syringe has been removed from the fill port, re-attach the fill port cap to the Infusor's™ fill port

- check the Infusor™ for leaks and inspect the solution for particulate (see Checking for Particulate in Vials, Syringes, and Final Products)
- take a photo of the labelled final product for the final product check (if using PharmacyKeeper for the final product check)
 - ✓ If PharmacyKeeper cannot be used for the final product check, then the final product check must be completed via direct observation

See Removal and/or Disposal of Used Supplies and the Final Product from the Biological Safety Cabinet

Note:

- when adding diluent or HD to the Infusor™, use one of the following methods:
 - i. invert the Infusor™ with the syringe attached, place the syringe plunger end flat on the work surface – grasp the syringe barrel with one hand, use slow, steady downward pressure to fill the balloon while steadying the Infusor™ with the other hand
 - or
 - ii. with the Infusor™ system in an upright position, use one hand to hold the syringe while the other hand applies slow steady pressure to the syringe plunger
 - ✗ do **NOT** apply pressure to the top of the Infusor™
- ✗ Do not inject too vigorously creating turbulence in the solution; this may create bubbles
 - small bubbles in the balloon itself will not cause problems; they will gradually dissipate as they move through the filter
 - air in the tubing may stop the flow of solution through the tubing, preventing drug from reaching the patient
- **USE ASEPTIC TECHNIQUE THROUGHOUT**

Force-Priming an Elastomeric Infusor™

ACTIVITY/STANDARD

- remove the winged luer cap from the distal end of the delivery tubing and place on a 70% isopropyl alcohol (IPA) swab away from the work area
- attach a syringe tip connector to the distal end of the delivery tubing
- attach a minimum 10 mL syringe to the syringe tip connector
- pull back the syringe plunger to create suction until fluid is observed in the syringe
- visually confirm that the fluid in the tubing is flowing and that the tubing is clear of air before use - **allow three drops of diluent to fall** onto a 70% IPA swab
- re-attach the winged luer cap to the distal end of the delivery tubing
- continue adding the diluent (if applicable) and then the drug
- **USE ASEPTIC TECHNIQUE THROUGHOUT**

Removing Air from the Tubing of an Elastomeric Infusor™

ACTIVITY/STANDARD

- ✘ do NOT remove the winged luer cap from the distal end of the delivery tubing
- hold the tubing between the pointer and middle fingers above the air bubble(s) and between the thumb and ring finger below the bubble(s)
- tap the tubing just below the bubble(s)
- move the tubing through the fingers as the bubble(s) moves through the tubing until they reach the distal end
- remove the winged luer cap from the distal end of the delivery tubing
- visually confirm that the fluid in the tubing is flowing and no bubbles remain - **allow three drops of diluent to fall** onto a 70% isopropyl alcohol swab
- re-attach the winged luer cap to the distal end of the delivery tubing
- continue adding the diluent (if applicable) and then the drug
- **USE ASEPTIC TECHNIQUE THROUGHOUT**

Cleanup and Waste Disposal in the Biological Safety Cabinet

ACTIVITY/STANDARD

- allow the biological safety cabinet (BSC) to purge for 5 minutes after the last compounding activity before decontaminating interior surfaces
- if the sharps container is at the maximum fill line:
 - ✓ seal the lid inside the BSC
 - ✓ decontaminate the outside of the container using a low-lint wipe moistened with a decontaminating agent
 - ✗ do NOT place the sharps container back on the work surface of the BSC once decontaminated
 - ✓ remove the sharps container and place into the larger hazardous waste container outside of the BSC
- if the sharps container is not at the maximum fill line:
 - ✓ close the lid inside the BSC
 - ✓ decontaminate, clean and disinfect the outside of the sharps container using low-lint wipes moistened with a decontaminating agent, then a germicidal disinfectant detergent, followed by sterile 70% isopropyl alcohol
 - ✓ either hang the container from the hooks inside the BSC or move it to the side of the work surface in the BSC
- decontaminate items from the supply tray and place into a zip lock bag (e.g., tweezers, pens); seal and remove the zip lock bag from the BSC
 - ✗ do NOT allow the zip lock bag to touch any surface inside the BSC
- decontaminate, clean and disinfect the supply tray in the BSC using low-lint wipes moistened with a decontaminating agent, then a germicidal disinfectant detergent, followed by sterile 70% isopropyl alcohol
- seal the non-sharps waste bag inside the BSC, decontaminate it using low-lint wipes moistened with a decontaminating agent and place in an appropriate hazardous waste container outside of the BSC
- decontaminate, clean and disinfect all other items in the BSC (if applicable) using low-lint wipes moistened with a decontaminating agent, then a germicidal disinfectant detergent, followed by sterile 70% isopropyl alcohol
- if removing other items to decontaminate the BSC, place in a zip lock bag and seal once they have been decontaminated

Note:

- ✓ if the decontaminating agent chosen contains a germicidal disinfectant detergent, then the supplies may be decontaminated and then disinfected without the additional cleaning step

Personnel Contamination

ACTIVITY/STANDARD

In the case of any hazardous drug (HD) spill, if there is or potentially is, personnel contamination either from the spill or the cleanup of the spill, the following procedures must be followed immediately:

Skin Contamination

Hazardous drug spilled on skin

- immediately remove contaminated Personal Protective Equipment (PPE) and / or clothing and dispose of it or label indicating the need for special handling for laundry according to Site Procedure
- immediately wash the affected skin thoroughly using soap and water for at least 15 minutes- use safety shower if appropriate

Skin cut with glass or other sharp object possibly contaminated with hazardous drug

- immediately remove contaminated PPE and / or clothing and dispose of it or label indicating the need for special handling for laundry according to Site Procedure
- immediately rinse the area with warm running water and allow the wound to bleed freely
 - ✗ **do NOT squeeze the area**
- wash the wound area thoroughly using soap and water for a minimum of 15 minutes

Needle injected into skin

- immediately remove contaminated PPE and / or clothing and dispose of it or label indicating the need for special handling for laundry according to Site Procedure
- immediately rinse the area with warm running water and allow the wound to bleed freely
 - ✗ **do NOT squeeze the wound area**
- wash the wound area thoroughly using soap and water for a minimum of 15 minutes

Eye Contamination

- CALL OUT FOR HELP
- Remove gloves and contaminated clothing (if applicable)
- Immediately proceed to eyewash station
 - ✓ remove contact lenses if applicable
 - ✓ gently flush the affected eye(s) at an eyewash fountain with water or isotonic eyewash designated for that purpose for a minimum of 15 minutes
 - ✓ hold your eye(s) open with your thumb and finger and look directly into the water stream – move your eye(s) around
 - ✗ **do NOT rub eyes**
 - ✗ **do NOT use tap water as pressure damage can occur**

Following all cases of personnel contamination

- note which drug was involved in the contamination and approximately how much
- have someone check to see if there is an antidote available
- obtain medical attention
- the employee will inform their family doctor of the exposure
- call the Workplace Health Call Centre Line at 1-866-922-9464 to report; Workplace Health will send a report to the employer and a copy will be placed in the employee's exposure record

Refer to [Systemic Therapy Procedure Number V-30: Hazardous Drug Spill Management](#)

Hazardous Drug Spill Control in Pharmacy - Cleanup of a Spill Within a Biological Safety Cabinet

ACTIVITY/STANDARD

- as soon as a hazardous drug (HD) spill occurs - cease all compounding activity
- have someone inform the supervisor that a spill has occurred
- if personnel contamination has occurred or potentially occurred, see Personnel Contamination – this procedure takes precedence over cleanup of the spill itself
- restrict movement of personnel near the biological safety cabinet (BSC) to optimize proper airflow of the BSC and minimize the risk of air spillage, e.g., moving HD-contaminated air out of the front of the BSC and into the room
- if outer gloves have been contaminated, remove them immediately within the BSC and dispose of them into a hazardous waste container within the BSC - remove hands from the BSC and don a new pair of outer gloves before proceeding further
- place a sign on the door indicating **“DO NOT ENTER - Cleaning/Decontaminating the BSC”**
- obtain a spill kit and don additional Personal Protective Equipment (PPE) (including a NIOSH-approved elastomeric half face mask respirator with appropriate filter cartridges, safety goggles, and a face shield)
 - ✓ before each use of a respirator:
 - annual respirator fit testing must be completed
 - positive and negative pressure seal checks must be performed to ensure proper functioning
 - ✓ don a medical mask over the respirator (NOT under) if the exhalation valve on the respirator is not filtered
 - ✓ remove medical mask in the anteroom before donning the respirator and dispose of it into a hazardous waste container; do not reuse this medical mask if wearing one over the exhalation valve on the respirator
- use the contents of the spill kit, as appropriate, to clean the spill
 - ✓ liquids are blotted with absorbent material (gauze pads, spill-control pads, etc.)
 - ✓ solids are wiped with wetted absorbent material in such a way as to limit their spread and minimize aerosol generation
- any broken glass fragments are picked up using a scoop (never the hands) and placed in a HD sharps container which goes into a larger HD disposal container along with all other contaminated waste
- the spill area is decontaminated by wiping three times using a decontaminating agent followed by sterile 70% isopropyl alcohol (sIPA) (decontaminating agent-sIPA-decontaminating agent-sIPA-decontaminating agent-sIPA)
- if the high efficiency particulate air (HEPA) filter has been contaminated, the internal and external exhaust fans of the BSC should be turned off and the front opening sealed off
 - ✓ label the BSC as contaminated until the filter can be changed and disposed of properly by trained personnel wearing appropriate PPE
- dispose of all cleanup materials in hazardous waste containers, seal and decontaminate the containers using a decontaminating agent prior to removal from the BSC
- place the containers into a rigid hazardous waste container outside of the BSC and seal
- dispose of PPE used during the spill cleanup in a rigid hazardous waste container and seal
- decontaminate the entire BSC after spill cleanup
- allow the BSC to run (purge) for thirty (30) minutes after decontamination prior to any aseptic compounding
- document incident in exposure records of employees involved in the spill and/or spill cleanup
- call the Workplace Health Call Centre Line at 1-866-922-9464 to report; Workplace Health will send a report to the employer and a copy will be placed in the employee’s exposure record
- replace all used items in the spill kit immediately following the cleanup

Hazardous Drug Spill Control in Pharmacy - Cleanup of a Spill Outside the Biological Safety Cabinet that may Reasonably Be Contained and Cleaned Within the Centre's Capacity

ACTIVITY/STANDARD

- isolate the area
- alert all individuals in the area of the spill so as to prevent spread of the spill
- reasonably restrict the number of personnel involved in the cleanup
 - ✗ **never work alone**
- inform the supervisor that a spill has occurred
- if personnel contamination has occurred or potentially occurred, see Personnel Contamination – this procedure takes precedence over clean up of the spill itself
- obtain a spill kit
- don full Personal Protective Equipment (PPE) (including a NIOSH-approved elastomeric half face mask respirator with appropriate filter cartridges, safety goggles, and a face shield
 - ✓ before each use of a respirator:
 - annual respirator fit testing must be completed
 - positive and negative pressure seal checks must be performed to ensure proper functioning
 - ✓ don a medical mask over the respirator (NOT under) if the exhalation valve on the respirator is not filtered
- use the contents of the spill kit, as appropriate, to limit the spread of and to clean the hazardous drug (HD) spill
 - ✓ liquids are blotted with absorbent material (gauze pads, spill-control pads, etc.)
 - ✓ solids are wiped with wetted absorbent material in such a way as to limit their spread and minimize aerosol generation
- any broken glass fragments are picked up using a scoop (never the hands) and placed in a HD sharps container which goes into a larger HD disposal container, along with all other contaminated waste
- the spill area is decontaminated by wiping three times using a decontaminating agent followed by sterile water for irrigation (decontaminating agent - sterile water - decontaminating agent - sterile water - decontaminating agent - sterile water – this process should be done by pharmacy or housekeeping staff as has been determined in site-specific housekeeping contracts; refer to Site Directive
- dispose of all cleanup materials in containers, seal and place into a larger rigid hazardous waste container
- dispose of PPE used during the spill cleanup in the rigid hazardous waste container and seal
- document incident in exposure records of employees involved in the spill and/or spill cleanup
- call the Workplace Health Call Centre Line at 1-866-922-9464 to report; Workplace Health will send a report to the employer and a copy will be placed in the employee's exposure record
- replace all items used in the spill kit immediately following the cleanup

Hazardous Drug Spill Control in Pharmacy - Cleanup of a Spill Outside the Biological Safety Cabinet that may be Beyond a Centre's Capacity to Contain and Clean

ACTIVITY/STANDARD

- alert all individuals in the area of the spill so as to prevent spread of the spill
- isolate the area to prevent personnel exposure to the hazardous drug (HD)
- avoid aerosol generation and dispersal of powder or liquid spilled
- inform supervisor that a spill has occurred
- if personnel contamination has occurred or potentially occurred, see Personnel Contamination – this procedure takes precedence over clean up of the spill itself
- upon confirming the size of the spill, the supervisor will call for the external Hazardous Material (HazMat) Response Team according to the Site Directive (i.e. Code Brown)
- remain available to the HazMat team to provide details as to the HD spilled, the quantity spilled and the circumstances and extent of contamination
- document incident in exposure records of employees involved in the spill and/or spill cleanup
- call the Workplace Health Call Centre Line at 1-866-922-9464 to report; Workplace Health will send a report to the employer and a copy will be placed in the employee's exposure record
- replace any used items in the spill kit immediately following the cleanup if applicable