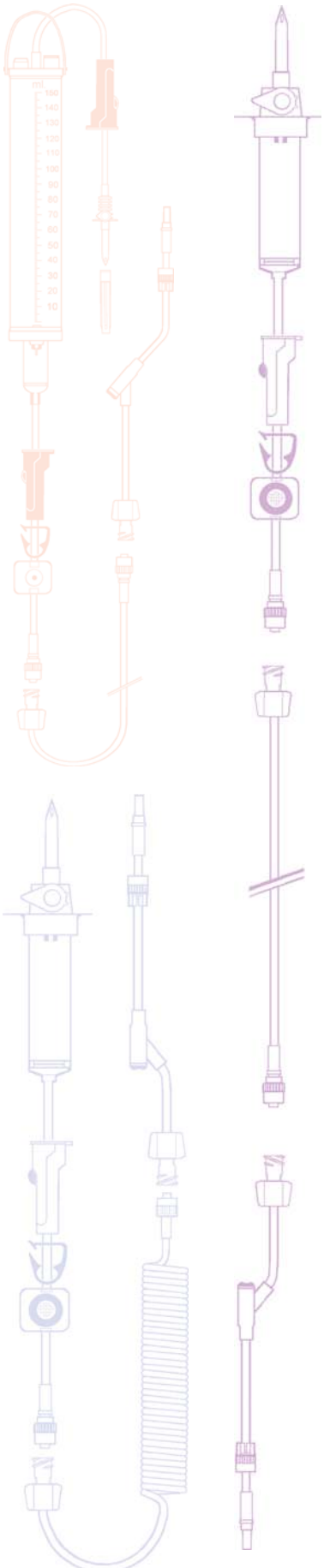
Moduflo Giving Sets - Make the most



ModuFlo infusion lines offer the most versatility of any infusion line on the veterinary market

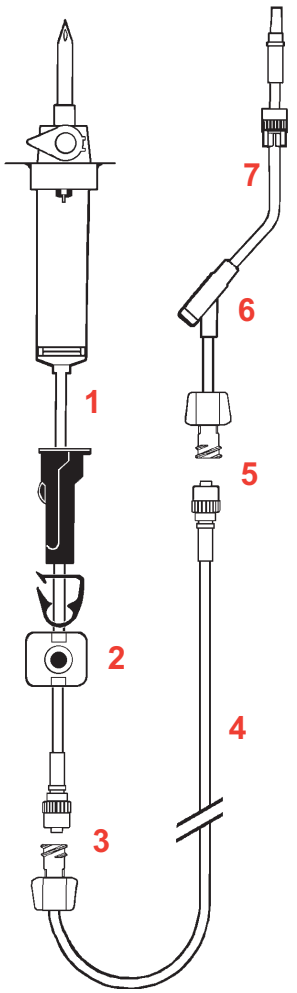
ModuFlo sets deliver most when you need:

- **Performance** with difficult patients
- **Economy** with long term infusions
- **Versatility** to adapt to patient's needs

This guide illustrates the use of ModuFlo sets to their optimum, ensuring you make to most of their potential and covers the following aspects:

- **Basic giving set**
- **Needle-Free valves**
- **Check valves**
- **Flow Regulators**
- **Surgical lavage**
- **Connection summary**

A modular infusion line



ModuFlo line design

A key feature of the ModuFlo range is the simplicity of their design. What could be easier than a range that differs only by the chamber size and main tubing type, yet look after the infusion needs of all your patients.

- **Paediatric sets**. The Burette (IBM200TY) and Paediatric (IPM200TY) sets differ only by the chamber type. Drop size is still 60-drops/ml
- **Supreme & SpiroFlo sets**. These sets differ only by the mid section tubing. The chambers (20-drop/ml) are identical.

All sets feature the following numbered design criteria:

- Infusion pump-compatible tubing (# 1); for Optima VS, Vet Pro & Niki IV pumps
- Two injection ports (# 2 & 6)
- Low injection priming volume (<0.5ml from distal port; # 6)
- Two in-line luer connections (# 3 & 5)
- Replaceable mid-section tubing (# 4)
- Non-kinking replacable end section extension (# 7)
- Mid & End tubing section replacements are available as standard items.

Use on an infusion pump

To use on a standard infusion pump, use only tube section (# 1). If using a non-dedicated Baxter pump, use the EPUMP-BX Baxter pump extension at the proximal luer connection (# 3) and run this tubing through the pump. See pages 4 & 13 of our catalogue for detals.

The ModuFlo set as a basic infusion line

To use as a standard infusion line, simply open the set then:

- Tighten luer connections (# 3 & 5)
- Connect to fluid bag and prime as normal
- Attach to patient and use as usual

There is no need to use or worry about the luer connections if they are not required.

Changing your infusion set up

The ModuFlo system allows you to alter your infusion set up at any time, including after the infusion has commenced. You can add components or alter the set to suit your patient's needs as these become apparent:

- Convert one set to another by changing tubing or chambers
- Add extensions to suit patient's needs
- Add valves or connectors to improve patient safety
- Add flow regulators to improve accuracy of rate adjustment
- Replace mid or end tube sections as required
- Supreme sets out-perform standard spiral tube sets on kink-resistance and versatility on length

Replacing parts of the set

The ModuFlo system allows you to replace just parts of the infusion set rather than replacing the entire set. This provides greater economy and flexibility, especially with longer term infusions.

- Change just the end extension (7) when replacing catheter
- Swap end extensions prior to connecting to patient if you prefer a T-connector or minibore extension. Saving the standard extension for use on another patient avoids waste.
- Change the mid section (4) if the patient damages the tubing
- We supply replacement mid and end sections for all ModuFlo sets; the only part you cannot replace is the chamber section.

Integral end extension

All ModuFlo sets include an integral kink-proof end extension as standard. This allows simple patient disconnection from the set without needing to use a seprate T-connector extension. See part 2 for details of patient mobility.

Tubing can be looped without risk of kinking. Attach the distal tubing to your patient above the catheter to prevent catheter displacement.

The distal Y-port will be mobile and freely accessible, even after dressing the placement site.

Distal tubing attached to 22G catheter & looped firmly

Connectors & connection options

You can use virtually any connection extension or adaptor on ModuFlo sets, provided they have standard luer connections.

Please refer to part 7 (Connection Summary) for advice on the best location (proximal or distal luer) for these.

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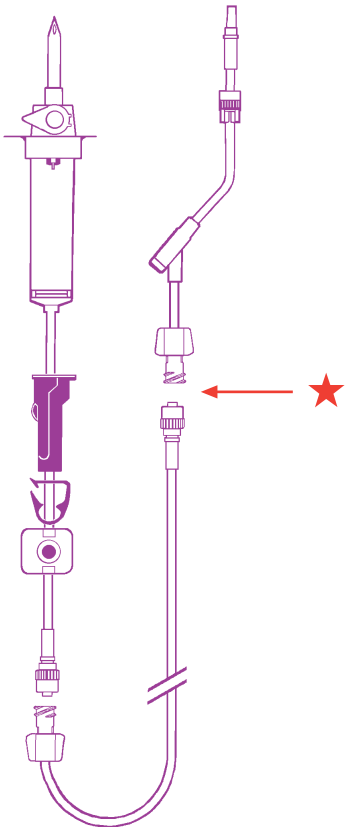
Patient Mobility: Using Needle-Free valves



Move your patient, not the infusion line...

The end extension of the ModuFlo system allows you to disconnect your patient from the infusion set, fluid reservoir or infusion pump with a minimum of fuss. As well as decreasing the risk of catheter displacement, it also provides you with major savings in both time and convenience. **Do NOT underestimate the time & cost saving this system can make to your daily patient management.**

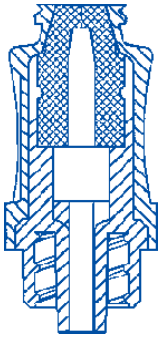
Needle-Free valve

To do this safely, you need to cap the end extension with our needle-free valve. This valve ensures the fluid path is closed when the set is disconnected from it.

When the set is disconnected, you should also cap the free end male luer with your preferred device. We recomend using our closed caps.

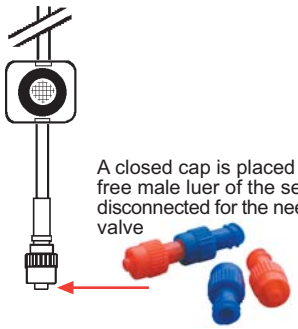
Closed Caps

Valve design and function

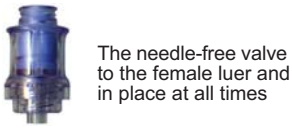


- Silicone material with central slit
- Fully swabable, so does not need capping
- Pressure from male luer opens & activates valve
- When not in use, valve surface remain firmly closed
- When connected, fluid & air moves freely both ways
- Valve can be autoclaved if asepsis is broken prior to use
- Valve can be activated with:
  - Syringes
  - Infusion lines
  - Extension lines
  - Insulin syringes
  - Small gauge needles

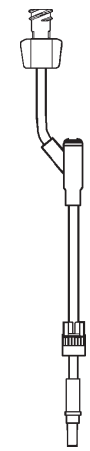
NOTE: Our needle-free valves never need to be removed once in place, other than for routine changing



A closed cap is placed on the free male luer of the set when disconnected for the needle-free valve



The needle-free valve attaches to the female luer and remains in place at all times



Using the needle-free valve

Flow is **Right** to Left

CONNECTING the needle-free valve

- Disconnect end extension from mid-section tube
- Connect valve to female luer of end extension and prime as normal, removing any air present
- Reconnect mid section tube to the valve

DISCONNECTING patient from the set

- Stop fluid flow (c-clamp or pump) as normal
- Remove mid section male luer from valve
- Cap the mid-section male luer with a closed cap
- If gross contamination is expected, place a non-actvating cap over the valve surface

RECONNECTING your patient and set

- Swab the blue valve membrane with alcohol
- Remove the closed cap from the mid section tube
- Connect male luer back into valve & secure
- Restart fluid flow

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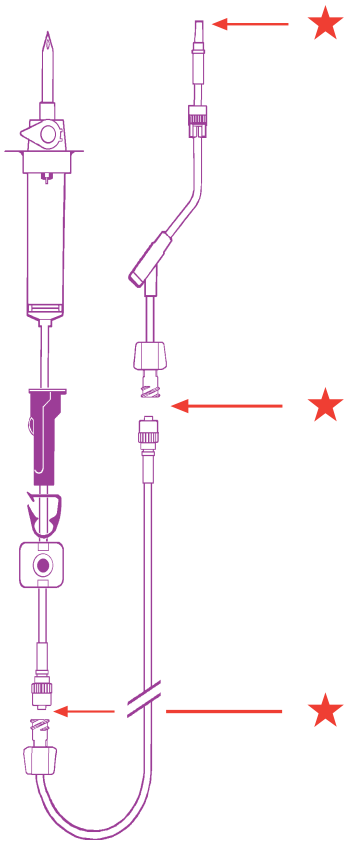
Patient Safety: Using Non-Return valves



Preventing back-flow in your infusion line ...

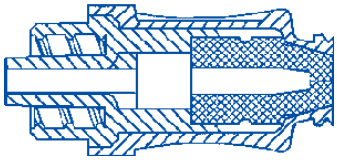
Inclusion of a one-way (check) valve at any point on a ModuFlo line minimises or prevents the risk of a number of problems we encounter commonly in practice. Their use improves patient safety, reduces nursing time and improves economy:

- Catheter occlusion due to micro back-flow of blood
- Blood loss due to damage to line proximal to valve
- Blood contamination of set proximal to valve

Valve design and function

- Silicone disc valve with low opening pressure
- Allows flow or fluid and air
- Simple male & female luer connection to fit into any luer connection
- When **upstream** pressure is higher than downstream (**normal** infusion) the valve is open and fluid or air flows distally
- When **downstream** pressure is higher than upstream (occlusion or **back-flow**) the valve closes and prevents blood entering the catheter or line
- Prime the valve with fluid prior to use. This minimises risk of back-flow or air embolism

NOTE: Our check valve is '**always open**'. It needs a cap placing proximal to it when a line is disconnected to prevent siphoning of air into the line distal to the valve. The simplest method is to use our needle-free valve



Check valve

Needle-Free valve

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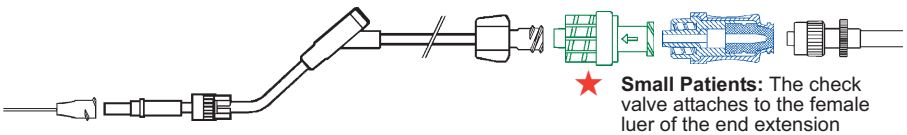
Check Valve Positioning & Use

*** Check valves** provide the **most protection** when they are placed **as close as possible to the patient ***

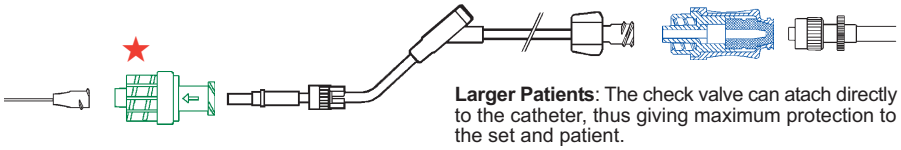
- Always ensure the check valve is DOWNstream of the closing cap or needle-free valve
- If positioned onto catheter, you should replace the check valve at every catheter change
- There should always be a cap positioned proximal to the valve when the set is disconnected from it. The simplest and safest way of doing this is to use our needle-free valve.
- Final position will depend on a number of factors such as patient size, risk factors to IV line and imporance of occlusion resistance. The following guidance is suitable for most patients:



Small Patients: The check valve attaches to the female luer of the end extension

Small patients

- Connect the valve into the end extension
- Allows full mobility
- Provides minimal bulk at catheter site



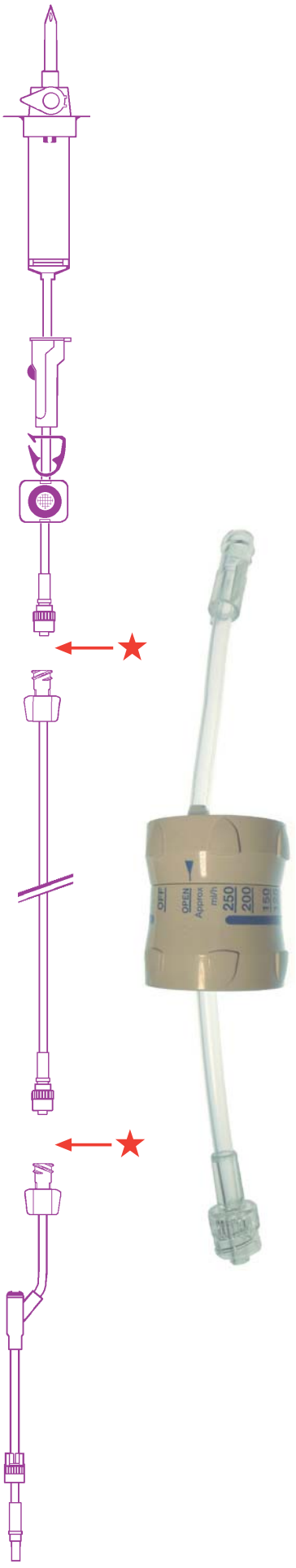
Larger Patients: The check valve can atach directly to the catheter, thus giving maximum protection to the set and patient.

Larger patients

- Connect the valve directly onto the catheter
- Provides maximum patient protection
- Extra bulk at catheter site is normally well tolerated by larger patients

With ModuFlo sets, you do not need to worry about having end extensions etc in place when setting up your infusion; it's there already if you should need it

Improved Flow Adjustment: Using Flow Regulators



Infusion accuracy made easy...

Flow regulators make flow adjustments at low rates or with frequent adjustments so much esier. With the ModuFlo range you can regulate any set of your choice, and use your preferred valve type.sets. In addition, both regulators can be added after the infusion has commenced. This gives you a choice of 8 set/valve combinations, and includes Spiral and Burette sets

Flow Regulator (FPV250-T)

Flow regulators avoid the problems we see with normal roller valve control. These problems include tubing compliance and 'valve creep'.

- **Tube Compliance**: When adjusting a roller valve, the tubing is squeezed and takes a short while to fully adapt to the new setting. This means that the flow rate is different when you check a few minutes after setting the flow rate correcly.
- '**Valve Creep**': After adjustment, a roller setting can be displaced slightly into a different position. This results in different flow rates than originally set.

Valve design and function

- The valve has a series of internal channels through which fluid flows
- The size of these channels dictates how fast fluid flows
- Changing the 'rate' on the valve immediately changes the channel size
- Any such change takes effect immediately, and does not rely on tubing compliance
- As a result, the new flow rate can now be calculated immediately by counting the drip chamber, rather than waiting for a new setting to stabilise
- This regulation allows accurate, frequent changes at low flow rates

Flow rates on valves are always approximate. ALWAYS confirm actual flow rate by counting the chamber drip rate

Main Applications

- **Accurate, immediate** flow rate adjustments on **any** patient
- **Frequent** adjustments at **low** flow rates (especially on **small** patients)

Optimal valve positioning

Flow regulators work regardless of their in-line position, but are more effective and economical when placed at the **PROXIMAL** luer connection on ModuFlo giving sets:

- Regulators work best when fluids are siphoned rather than pushed through them
- A proximal position allows easier access and adjustment without disturbing patients
- Proximal positioning prevents damage to the regulator mechanism
- When positioned proximally, the regulator does not interfere with patient mobility and reduces the risk of catheter disturbance

Benefits of the ModuFlo range with separate valves

The range of giving sets offer a number of advantages over standard regulated sets:

- Your choice of two regulator types to suit your needs & those of your patient
- Any set can have a regulator added if required, including our burette & spiral sets
- Regulators can be added after the infusion has begun, without disturbing the catheter
- If the set is damaged, the regulator will remain functional, so just replace the damaged section of the set

Flow Variance

All flow regulators have a variation between set rate and actual flow rate; this is 'flow variance'

- Always confirm flow rate by chamber drop rate
- Variance is consistant for each patient & kennel
- Contact us for more details if required

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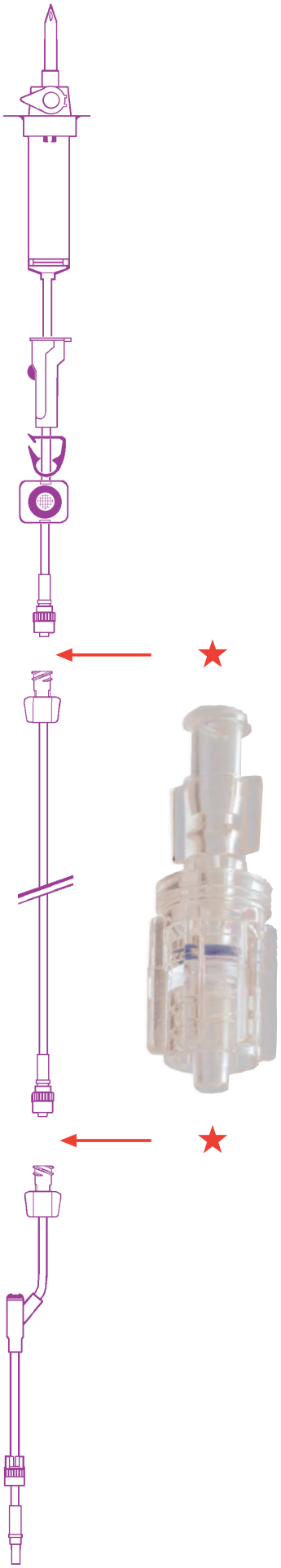
Prevent Line Twisting: Using Swivel Connectors



Avoid tangled and occluded lines...

Even the most rugged giving set can be tested to the extreme by patients that pace around their kennel, causing line twisting and potential occlusion.

A swivel connector (CSW-MF-1) is ideal in our ModuFlo set for these patients and can minimise the risk of complications from such patients. The in-line luer connections allow use of the swivel connector at either luer connection.

Swivel Connector design and function

- The swivel connector secures firmly into normal luer connections
- The silicone O-ring seal allows full 360° fluid-tight rotation of the connector
- The two tube sections can now rotate independant of each other

Main Applications

- Preventing twisting of giving set
- Always ensure luer connections are firmly tightened when using this connector

Optimal positioning

As swivel connectors work well at any in-line luer connection, the choice of position depends largely on the patient, kennel environment and giving set you are using. Some patients benefit from a swivel connector at both luer connections.
Soft tubing (pump-compatible)at a luer connection (proximal) is still prone to twisting or kinking if the swivel connector is located adjacently. The male luer may need to be taped to the kennel door, or alternatively place the swivel connector at the distal luer connection.

- **Proximal** luer: helps to protect the softer valve section of tubing
- **Distal** luer: prevents the main part of the set becoming tangled with patient
- We do NOT recommend using the swivel connector directly on the catheter

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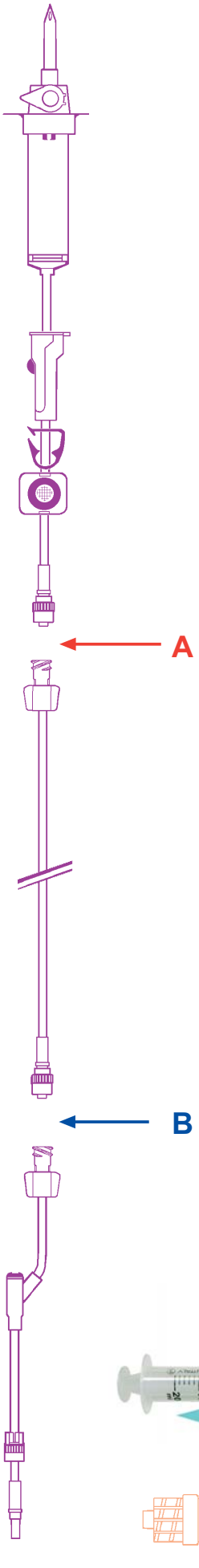
Surgical Lavage



ModuFlo sets are ideally suited to surgical lavage...

- Rapid gravity flush using Supreme ModuFlo set with end extension removed
- Drug additives (eg antibiotics) can be mixed into lavage fluids at a pre-determined concentration using the Burette ModuFlo
- Mobile end luer collar allows placement of the narrow luer tip into cavities or sinus tracts
- Presence of TWO in-line luer connectors allows simple pressure lavage by either surgeon or non-scrub personnel
- Rapid gravity flush using Supreme ModuFlo set with end extension removed

Gravity Lavage

1. The set is passed to scrubbed personnel aseptically
2. The chamber is then passed back to non-scrub personnel
3. Attach the set to the drapes via a towel clip, using the distal luer connector to prevent the line slipping off the drapes
4. Non-scrub personnel primes the set and controls flow rate via roller valve & c-clamp

Pressure Lavage

1. The set is prepared as in steps 1-4 above, for gravity lavage
2. Prior to priming, a stopcock is added to either luer connection; this allows pressure lavage for a variety of applications
3. For maximum benefit (and minimal effort) use a ***wide bore*** stopcock
4. Maximum benefit is gained by using a syringe of at least 20 ml capacity

NON-sterile Lavage

A. - Stopcock and syringe are opened and fitted by non-scrub personnel
- Attachment is made and operated from the ***PROXIMAL*** luer connection (A)

STERILE Lavage

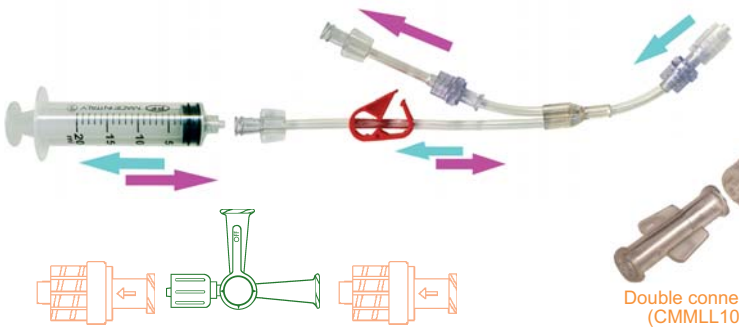
B. - Stopcock and syringe are passed to the surgeon aseptically
- Attachment is made and operated from the ***DISTAL*** luer connection (B)

Useful Tip

When repeated flushes of significant volume are required, use a Check Valve at either end of the stopcock, or our active drainage extension, prior to attaching to the ModuFlo set. This allows aspiration and flushing of the fluid in a one-way direction only without the need to adjust the stopcock handle twice on every flush cycle.

***Note**: when using this technique, it is normal to get gravity flow between each flush cycle. If this is undesirable, you should use just the plain stopcock.*
You will also need one of our double connector packs (CMMFF10) to reverse the luer direction of the active drainage extension on the ModuFlo set.

Active drain extension (DRACTIVE2)



Double connector (CMMLL10)

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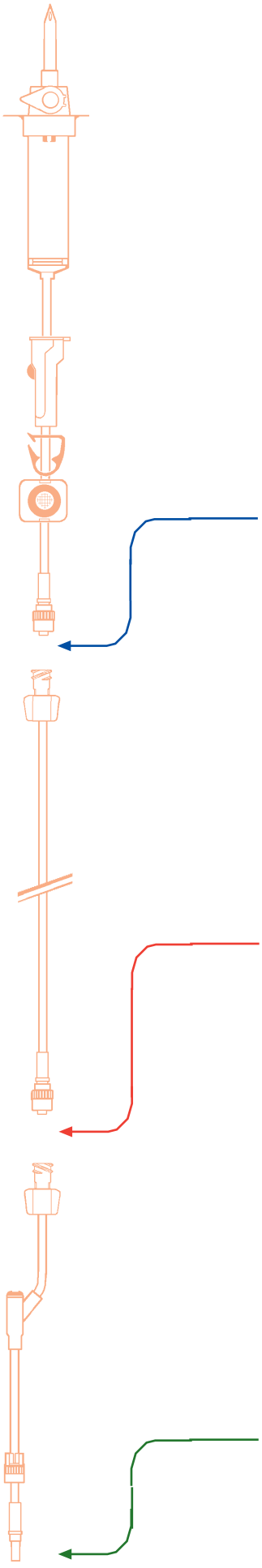

Suitable connections for ModuFlo sets

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www.infusionconcepts.com

The following are recommendations as to the most appropriate location for various connectors and extensions in our range when used on ModuFlo sets. The list of our product range is not exhaustive, but serves as an illustration. You will need to determine your own preference for product and location based on your clinical environment and protocols.

Proximal Luer Connection

Product Code(s)	Description or comments	ModuFlo Set Code
ESS55180	Straight extension; standard bore	ISM260TY
ESN41110	Straight extension; standard bore	IBM/IPM200TY
ECS41250	Spiral extension; standard bore	ICM20370
FPV250T	Flow Regulator extension	ALL sets
EY4125CC, EY5514CC	Y-connector & extension	ALL sets
SC4-W1FG, SC4-W3NB	Wide-bore stopcocks	ALL sets
EPUMP100	Optima Infusion Pump extension	ALL sets
CSW-MF-1	Swivel connector	ALL sets

Distal Luer Connection

Product Code(s)	Description or comments	ModuFlo Set Code
ESS55180	Straight extension; standard bore	ISM260TY
ESN41110	Straight extension; standard bore	ALL sets
ECS41250	Spiral extension; standard bore	ISM260TY/ICM20370
ECN30135	Spiral extension; narrow bore	IBM/IPM200TY
EY4125CC, EYFNV2C02 etc	Y- & W-Connectors	ALL sets
CSW-MF-1	Swivel connector	ALL sets
FCV-MF-1	Check Valve	ALL sets
FNV-MF-H	Needle-freeValve	ALL sets
INJCAP10, EVAINJ01	Injection Caps	ALL sets
CLOSED10, EVACLD2	Closed Caps	ALL sets

End Male Luer

Product Code(s)	Description or comments	ModuFlo Set Code
FCV-MF-1	Check Valve (larger dogs only; direct to catheter)	ISM/ICM
CLOSED10, EVACLD02	Closed Cap (onto male luer of extension)	ALL sets
INJCAP10, EVAINJ01	Injection Cap (directly onto catheter)	ALL sets