

Surgical Note

Preventing Clots in the Catheter Tip

Device Hydration

- The catheters are very hydrophilic and, if not hydrated, will absorb water from the blood. This can cause the gel to recede due to catheter expansion and leave a void at the tip of the catheter, which could increase the risk of blood clot formation.
- Always hydrate the device with sterile saline before implantation.
 - For small animal devices, use room temperature (not warmed) saline and hydrate for 30 minutes. Use of warmed saline can result in bubbles forming in the gel of the catheter tip, which can result in clot formation and dampen the quality of the signal.
 - For large animals, use room temperature or warmed saline and hydrate for at least 30 minutes (60 minutes for longer catheters of 35-40 cm) before implantation.
 - This procedure can be found in the surgical manuals posted on the DSI Support Center.

[Link to Surgical Manuals](#)

Handle with Care

- Never hold the device up by just the catheter.
- Always use vessel cannulation forceps when handling the tip of the catheter. Make sure that the catheter is seated properly in the track of the vessel cannulation forceps so that no pressure is being placed on the catheter.
- Hold the distal end of the tip cover when removing it rather than pulling from where the tip cover meets the catheter. This helps to prevent gel loss in the tip and lowers the risk of damaging the catheter.

[Preventing Damaged Sensors in Blood Pressure Implants](#)

Inserting the Catheter

- When inserting the catheter into the blood vessel:
 - Make sure to not bend or force the catheter into the vessel. If the catheter bends, gel will be lost, and blood will clot in the void.
 - Always look at the catheter after it has been inserted into the vessel. Any blood in the tip of the catheter should be visible at this point. If gel is dislodged when inserting the catheter into the blood vessel, remove the catheter and regel. Failure to do so will result in a clot in the tip of the catheter.
 - Make sure that the tip of the catheter is in free-flowing blood. Poor placement of the catheter tip will result in clotting over time.
 - When cannulating the ligated carotid artery, the tip of the catheter should be in the aortic arch which has free-flowing blood. If not inserted far enough, the tip of the catheter will remain in the carotid, resulting in clot formation.
 - When cannulating the ligated femoral artery, the tip of the catheter should be in the abdominal aorta which has free-flowing blood. If not inserted far enough, the tip of the catheter will be in the femoral artery, resulting in clot formation.

When to Regel

- Regel after any of the following events:
 - If gel is lost when removing the tip cover
 - If gel is lost during catheter insertion
 - If the catheter is bent sharply causing loss of gel
 - After explanting the catheter if the device will be reused
 - After cleaning and re-sterilization
 - Just before inserting the catheter if a void in the catheter tip is noted upon inspection

More information on how to regel:

[VIDEO: Guidelines for the Regel of Mouse-sized Catheters](#)

[VIDEO: Guidelines for the Regel of Small Animal Catheters](#)

[Guidelines for the Regel of the PhysioTel and PhysioTel Digital Large Animal Devices](#)

Explanting the Device

- It is normal to see 0.25 to 0.5 mm of blood in the tip of the small animal catheter and up to 0.75 mm of blood in the tip of the large animal catheter.
 - If a greater amount of blood is observed in the catheter tip, then it is likely that a clot had formed. This could be due to improper hydration, handling, insertion or regel.
- If the device will be reused, it is important to immediately rinse the catheter by holding the catheter tip upward into the flow of water from a faucet. If clots are not addressed right after explant, they become very difficult to remove.
- It is recommended to re-gel the catheter after rinsing and before storage.

Other Resources

[Reduce the Risk of Air Bubbles in the Catheter Tip](#)