

Surgical Note

Recommendations to Prevent Large Animal Biopotential Lead Breakage

Lead breakage may be caused when there is not enough excess lead to allow for growth and movement of the animal. To ensure the animal can grow and exhibit normal behaviors without causing leads to break, the following are recommended:

Ensure the proper length leads have been ordered

Order devices with the longest possible lead length that will meet the species size and expected growth and ensure that natural body movements have been accounted for when selecting lead length. This will provide the user with excess lead material in most species. The leads can then be trimmed to the appropriate length as needed for each species. If the device has a solid tip that will be placed in the jugular, the excess lead length can be tucked back into the device pocket after being placed. Please refer the article [Recommended Catheter Lengths and Configurations in Large Animals](#) for additional length recommendations. Having excess lead length is the best way to prevent lead breakage.

Account for normal body movements

When determining how much excess lead material to leave in the device pocket or area of placement, consider the animal's natural movements. This will allow enough lead length to accommodate these movements without stretching the leads to the point of breaking. Example: EMG leads placed in the neck must have extra lead in the device pocket as well as in the neck to accommodate the animal's natural head movements (i.e. tilted down and movement side to side).

Account for normal growth patterns

Determine areas of growth for your species. Device placement can help mitigate the stretching of the leads in relation to growth. For example, swine grow quickly in length from their torso, so it is recommended to place the device in the neck area where they exhibit very little growth in length. This will mitigate the leads from being stretched as they grow and possibly breaking.

Butterfly the excess leads within the device tab

To account for extra lead length, the leads can be looped through one of the device tabs on the long side of the device. This will allow for extra lead material to be kept tidy within the pocket while also ensuring there is enough slack in the leads that can easily be pulled from the pocket to prevent breakage. Not doing this may result in leads being tangled within the pocket and unable to pull out of the device pocket when needed. You may find that placing the device in the pocket with the looped leads deeper in the pocket will result in easier suturing. Extra catheter length can also be looped with the leads. Below is an example of an M device with the ECG leads butterflied:

