



THE VETERINARIAN'S GUIDE TO USING A GROUNDING PAD DURING ELECTROSURGERY



Veterinary Electrosurgery

For veterinarians, electrosurgery can be used daily for procedures involving general surgery or emergency treatment, such as:

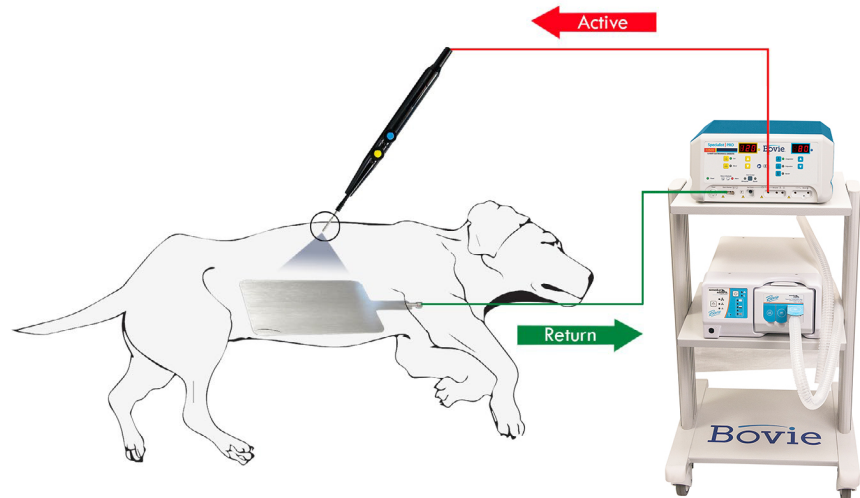
- spay/neutering
- dental and oral care
- ear cropping and tail docking
- eyelid surgery and epilation
- de-clawing and de-barking
- dermal lesions, biopsies, and bleeding

The use of electrosurgical techniques in the vet practice can increase practice efficiency, reduce procedure times which in turn reduces the facility cost-to-serve. In most cases, to properly use an electrosurgery device, the patient must be properly grounded using a grounding plate. In this e-book we address the appropriate use of electrosurgery grounding plates and when their utilization is required.





Electricity is a flow of electrons around a **circuit**. Remember the word **circuit**. Electrosurgery is the reengineering of electrical energy to produce various waveforms used for the cutting and coagulation of tissue. In order to perform electrosurgery you must have a closed **electrical circuit**.



For any electrosurgical procedure there are four components that are required to complete the electrosurgical circuit:

1. The Electrosurgical Generator (ESU)
2. Active Electrode
3. Patient
4. Return Electrode (Ground)

The four components vary depending on the electrosurgical application in use; monopolar or bipolar.

Monopolar Electrosurgery

In monopolar electrosurgery the completed **circuit** includes:

1. The ESU - like the A1250S-V or A3350-V. The ESU contains a high-frequency oscillator and amplifiers which convert the electrical energy into a variety of surgical waveforms. The ESU is the energy source.
2. The Active Electrode - an electrosurgical pencil with an electrosurgical tip which is connected to the ESU. The electrosurgical tip delivers the energy to the surgical site on the patient.
3. The Patient - the energy delivered from the active electrode is then safely dispersed through the patient back to the return electrode.

4. The Return Electrode - This is the **grounding plate**. The grounding plate, usually under the patient near the surgical site, connects back to the ESU. The energy delivered through the patient is collected here and returned to the generator.

Monopolar electrosurgery affords the surgeon more energy output flexibility. In monopolar you can not only coagulate but also cut tissue. A higher volume of surgical procedures can be performed using monopolar energy modes.

Bipolar Electrosurgery

In bipolar electrosurgery the completed circuit is essentially the same, however a grounding plate is not required. The active and return electrodes (generally the tips of a pair of forceps or scissors) serve as the equivalent of the active tip and grounding plate. The electrosurgical current in the patient is restricted to a small volume of tissue in the immediate region between the surgical instrument (forcep or scissors). The **circuit** is completed between the two points of the electrodes. Bipolar is an excellent electrosurgical application for veterinarians.

The Grounding Plate – What it does and why it's important?

The grounding plate is a sheet of metal that is connected to a grounding cable which connects directly to the ESU. This sheet of metal provides a large surface area for the energy within the patient's body to return to, completing the **circuit**.



Why is this important? Two reasons:

1. A smaller ground would cause concentrated energy which could potential burn the patient. The larger surface area of the plate allows the energy to disperse and reduces the chance of patient burns.
2. If the grounding plate is not properly connected during monopolar procedures, the ESU will prompt an error code and not activate. The circuit must be complete in order for the unit to produce monopolar energy.

How to use a grounding plate?

The grounding plate can be a confusing electrosurgical accessory for some veterinarians or vet techs. There are many types of grounding plates; reusable, disposable, flexible, sticky, etc. So as a Veterinarian, what should you use?

Bovie recommends the use of their reusable metal plate. The use of this reusable plate allows the Veterinarian to ground the patient without shaving the pet, which leaves the patient with a bald spot and additional discomfort. Eliminating the need to shave the grounding pad site also reduces procedure time.

First and foremost, make sure the grounding plate is properly connected to the reusable grounding cable and ESU. If the plate is not properly connected, the circuit will not be complete and the ESU will not work.

Good contact with the patient is important. To ensure adequate contact a conductive gel must be used such as a polyhesive hydrogel or electrolyte jelly. The gel eliminates air pockets that could lead to patient burns and helps reduce impedance at the plate site allowing the energy in the patient's body to be easily collected and delivered back to the generator. The plate should be placed closest to the surgical site, where there is a large surface area of tissue to allow for suitable contact.

Some textbooks recommend that a damp towel be used between the patient and the grounding plate in place of the contact gel. Do not do this. The damp towel could shock your patient leading to unintentional patient burns and discomfort.

Once the patient is properly grounded, the circuit is complete, and the veterinarian can perform their electrosurgical procedure using the active electrode.

Commonly asked questions regarding Grounding Plates

1. I have a metal table; does this mean I cannot use electrosurgery?

No, Bovie recommends to following steps when performing electrosurgery on a metal patient table:

- Place a rubber mat on the table. Rubber is a resistant material.
- Place two surgical towels over the rubber mat
- Place the grounding plate on top of the two towels and rubber mat
- Ground patient as instructed above using the contact gel.



2. I have a ground reference unit; what does that mean?

High Frequency desiccators are considered ground reference units. Ground reference means that the earth (ground) acts as the return electrode. The energy passes through the patient's body and follows the path of least resistance to the ground. There are limitations to what these types of devices can do. These units are used for basic coagulation to perform simple skin procedures.

3. Can I use ultrasound gel?

Yes, ultrasound gel has been used by both Veterinary and Human practitioners in place of general electrode gel. However, it is always recommended to review the manufacturer's guidelines to determine if the gel used is appropriate for electrosurgical applications.

Get Grounded & Close the Circuit

Electrosurgical applications can enhance the veterinary facility's patient care and reduce their cost to serve. Understanding how to use the device and appropriate accessories like grounding plates is a critical success factor. The electrosurgical grounding plate is a key piece to the electrosurgical puzzle. Proper placement, patient contact and device connection will ensure that the electrosurgical **circuit** is complete and lead to successful procedures in the future.



More about your Bovie® peace-of-mind!

Humans have used heat to cauterize people and animals for ages. Heat has always been known to cut, sear, and coagulate tissues and vessels. But, it was not until the 1920s that [William T. Bovie](#), an inventor with a doctorate in plant physiology, worked with Harvey Cushing to introduce his electrosurgical unit to modern neurosurgery.

Eighty-eight years later, the Bovie system has become equipment-of-choice in operating rooms - human and animal. The name “Bovie” has become synonymous with the equipment and related procedures, but only Bovie Medical Corporation has copyrighted the name Bovie®.

The original Dr. Bovie concept remains, but Bovie Medical Corporation continues to lead advancements in safety, electronic technology, and electrosurgical accessories. Bovie’s pioneering design and quality manufacturing are supported, as you would expect, by excellent customer service. The Bovie Medical Corporation identity grew as the Aaron and Maxxim Medical product lines merged. They remain the first choice provider to hospitals and surgical centers as well as veterinary surgeries. [The Bovie® catalog](#) is the most complete inventory of United States manufactured electrosurgical generators.

Other veterinary products reflecting the Bovie® tradition of quality and innovation include low and high-temp cauteries, suction coagulators, and specialty lights. You can equip and custom design an entire veterinary surgery suite with the state-of-the-art quality represented by Bovie® products.

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Resources

¹ Bassert, Joanna M., Thomas, John, McCurnin's Clinical Textbook for Veterinary Technicians, 8th Edition, Surgical Instrument & Aseptic Techniques – Electrosurgery, 2014

² McCauley, Genard, Understanding Electrosurgery, 2010

³ Veterinary Technology Small Animal Operating Room, Rotation Resource Manual
<http://www.vet.purdue.edu/vettech/files/documents/saor-manual.pdf>

⁴ Bovie Medical Corp., Demystifying Electrosurgery for the Veterinarian Practice, 2014

