65-19 Synopsis of Electrosurgery Units (Project 02-04) (4/02)

Electrosurgery (ES) has been used in dentistry for over 50 years. ES units are able to cut or coagulate soft tissues by passing high-frequency waveforms or currents through them. ES is used in a wide range of applications in dentistry including gingivectomies, gingivoplasties, frenectomies, operculectomies, crown lengthening, and sulcular troughing for impression making. ES is also used to produce hemostasis. In general, ES is valued because it can produce pressure-less incisions, control hemorrhage, increase operative efficiency, and help maintain a clear view of the operative site.

Most ES units consist of four components: a current generator, active electrode, passive electrode, and an on-off switch. The current generator produces the high-frequency waveform, which usually ranges from 1 to 4 MHz depending on the power (e.g., 70 to 100 W). Higher frequency units produce less lateral heat at the operative site. The active electrode allows the current to enter the soft tissues. Electrode tips for the active electrode are available in various shapes and sizes for a variety of clinical procedures. There are three basic types of electrodes: wire, loop, and ball. Each is suited for a particular type of procedure. Wire electrodes are usually used for incising or excising, while loop electrodes are used for tissue planning. Ball electrodes are used for coagulation. The passive electrode, also known as the dispersive electrode or ground plate, is a flat, broad plate that contacts the patient's body. It allows the current that has entered the surgical site from the active electrode to return to the unit, thereby completing the circuit. The on-off switch activates and deactivates the unit and can be operated via a foot control or handpiece switch.

There are two basic types of ES units available today based on how the current flows from the active to the passive electrode. They are monopolar and bipolar. Both monopolar and bipolar ES units can be used to cut and coagulate tissues. Monopolar ES units are distinguished by the fact that they use a handpiece with a single electrode tip, and the current produced by the tip is drawn to a ground plate beneath the patient. When the tip is brought into contact with the soft tissues at the surgical site, a spark jumps between the electrode tip and the patient's soft tissue. The heat produced diffuses into 1 to 2-centimeter region peripheral to the surgical site. Because the heat is not confined to the immediate surgical area, a larger area of tissue can be affected. Bipolar ES units, on the other hand, use an asynchronous waveform, which causes cutting to occur without creating general tissue resonance. As a result, the heat that is produced does not extend outward from the surgical site. Bipolar ES units use a handpiece with two electrodes, one that acts as the active electrode and the other as the passive electrode. No grounding plate, therefore, is necessary. Current flow occurs only between the two electrodes and does not spread outwards into adjacent tissues. As a result, manufacturers of bipolar units claim they can be safely used near vital structures such as bone and tooth structure.

ES units have varying power, frequency, and waveform options. The type of waveform(s) the unit produces is an important characteristic because it determines the clinical application for which the unit can best be used. Four different waveforms are commonly encountered: fully rectified filtered (which cuts), fully rectified unfiltered (which cuts and coagulates), partially rectified (which coagulates), and fulguration (which causes surface destruction of soft tissues). The fully rectified filtered waveform can be used for all soft tissue surgery procedures. The fully rectified unfiltered waveform produces less effective cutting but causes superficial coagulation. It can be used for most minor surgical procedures (e.g., gingivectomy, gingivoplasty, excising hyperplastic tissue, gingival troughing). The partially rectified waveform is inefficient at cutting but produces good coagulation. Finally, fulguration causes superficial destruction by carbonizing soft tissues and is ideal for removing the remnants of cysts following enucleation.

This synopsis of electrosurgery units consists of a table listing eight units, their manufacturers, and basic features. Please note this information has been provided by the manufacturers and has not been verified by DIS testing. The information should assist dental supply personnel in selecting a unit best suited to their clinic's needs.

SYNOPSIS OF ELECTROSURGERY UNITS (1 of 3)

Product/Model	Hyfrecator 2000	DentoSurg 90	MC-4
Manufacturer	ConMed Corporation 525 French Rd Utica, NY 17676 (800) 448-6506 (315) 797-8375 (800) 438-3051 FAX www.conmed.com	Ellman International 1135 Railroad Ave Hewlett, NY 11557 (800) 835-5355 (516) 569-1482 (516) 569-0054 FAX www.ellman.com	Macan Eng & Mfg Co 1564 N. Damen Ave Chicago, IL 60622 (773) 772-2000 (773) 772-2003 FAX www.macanengineering.com
Type	Monopolar	Monopolar	Monopolar
Retail Price	$1,200.00	$1,495.00	$875.00
Government Price	$694.50	$1,345.50	$656.25
Operating Modes Available	High Low	Cut Cut/Coagulate Coagulate	Cut/Coagulate Coagulate
Number of Electrodes Included	50 disposable-sharp 50 disposable-blunt	6	5
Activation Method	Foot switch Handpiece switch	Foot switch	Foot switch
Dimensions (inches) H x D x W	4 x 7½ x 8¾	5 x 5 x 8	3½ x 5¼ x 8½
Weight (lbs)	6	7	8
Handpiece/Cord Sterilizable	No	Yes	Yes
Warranty on unit	5 years	1 year	2 years

Information provided by the manufacturers

SYNOPSIS OF ELECTROSURGERY UNITS (2 of 3)

Product/Model	MC-6	Sensimatic 600SE	Servotome ST Classic
Manufacturer	Macan Eng & Mfg Co 1564 N. Damen Ave Chicago, IL 60622 (773) 772-2000 (773) 772-2003 FAX www.macanengineering.com	Parkell Inc 155 Schmitt Blvd Farmingdale, NY 11735 (800) 243-7446 (631) 249-1134 (631) 249-1242 FAX www.parkell.com	Satelec Inc 130 Gaither Dr Mt Laurel, NJ 08054 (800) 289-6367 (856) 222-9988 (856) 222-4726 FAX www.satelecusa.com
Type	Monopolar	Monopolar	Monopolar
Retail Price	$1,095.00	$595.00	$700.00
Government Price	$821.25	$595.00	$500.00
Operating Modes Available	Cut Cut/Coagulate Coagulate Fulguration	Cut Cut/Coagulate Coagulate	Cut Cut/Coagulate Coagulate
Number of Electrodes Included	6	6	10
Activation Method	Foot switch	Foot switch	Foot switch
Dimensions (inches) H x D x W	2¾ x 11½ x 6½	3 x 6½ x 11	2¾ x 9 x 5½
Weight (lbs)	8	8	2.2
Handpiece/Cord Sterilizable	Yes	Yes	Yes
Warranty on unit	2 years	5 years	2 years

Information provided by the manufacturers

SYNOPSIS OF ELECTROSURGERY UNITS (3 of 3)

Product/Model	Bident 3001	Odontosurge 3
Manufacturer	Valley Forge Scientific 136 Green Tree Rd Oaks, PA 19456 (610) 666-7500 (610) 666-7565 FAX www.bident.com	XO Care A/S Handvaerkersvinget 6 P.O. Box 380 DK-2970 Horsholm, Denmark (800) 368-5776 (949) 376-4228 (888) 368-4787 FAX U.S. Distributor: Odonto~*Wave* 1136 East Stuart, #4203 Fort Collins, CO 80525 www.odonto-wave.com Government representative can be contacted at: (949) 376-4228 (949) 376-8268 FAX
Type	Biopolar	Bipolar
Retail Price	$6,250.00	$2,495.00
Government Price	$4,895.00	$2,250.00
Operating Modes Available	Cut Coagulate	Cut Coagulate
Number of Electrodes Included	6	6
Activation Method	Foot switch	Handpiece switch
Dimensions (inches) **H x D x W**	4½ x 10½ x 10½	2 x 9½ x 6¾
Weight (lbs)	11	6
Handpiece/Cord Sterilizable	Handpiece-No Cord-Yes	Yes
Warranty on unit	1 year	1 year

Information provided by the manufacturers