

The Value of Contact Quality Monitoring (CQM) Dispersive Electrodes versus Reusable, Capacitive Electrodes

Key Concepts

- Contact Quality Monitoring (CQM) dispersive electrodes are one of the most significant advancements in electrosurgical safety. They monitor the patient-pad interface to help reduce the likelihood of pad site burns
- CQM dispersive electrodes provide hospitals with a predictable cost per procedure that is less than reusable, capacitive non-CQM dispersive electrodes
- Disposable CQM dispersive electrodes require less hospital resources than reusable, capacitive non-CQM dispersive electrodes
- SureFit™ CQM dispersive electrodes allow hospitals to standardize by accommodating most patient sizes

Dispersive Electrodes

Dispersive electrodes, also known as return electrodes or ground pads, are designed to safely remove electrosurgical energy from patients during monopolar electrosurgery. Dispersive electrodes are named for their relatively large surface area which “dispersed” the radio frequency (RF) energy as it “returns” to the generator. The large surface area decreases energy density at the patient skin-dispersive electrode interface. This ensures no appreciable rise in skin temperature. There are several types of dispersive electrodes including single dispersive, dual dispersive, and capacitive.

For decades, single dispersive and capacitive electrodes were used to facilitate electrosurgery. However, electrosurgical injuries could occur as a result of poor contact between these electrodes and the patient. In such a situation, the return path of the electrosurgical generator could be compromised and the single dispersive or capacitive electrode would not adequately disperse the radio frequency (RF) current leaving the body. In certain circumstances, if energy density is concentrated, a return site burn could occur at the point where the dispersive electrode contacts the skin. The healthcare industry looked for a method to reduce the likelihood of this type of occurrence.

Contact Quality Monitoring Systems

One of the most significant advancements in electrosurgical safety has been the introduction of contact quality monitoring (CQM) systems. CQM allows electrosurgical generators and dual dispersive electrodes to work together to reduce the risk of dispersive electrode site burns.

CQM systems use a dual dispersive electrode design in addition to an interrogation current output by the electrosurgical generator. This current monitors the quality of the contact

between the patient and the dispersive electrode by measuring the impedance of the circuit across the dual plates of the electrode and the patient’s skin. If the patient becomes partially detached from the dispersive electrode, the measured impedance will increase. If a significant increase in impedance is measured, the electrosurgical unit will alarm and deactivate. This safety feature helps to prevent concentration of energy density over a small surface area at the patient skin-dispersive electrode interface that could result in a return site burn.

Today, ConMed Electrosurgery offers electrosurgical generators for the operating room that are always equipped with CQM. ConMed Electrosurgery only recommends single dispersive electrodes for applications using older electrosurgical generators that do not have CQM capability or for rare instances in which a dual dispersive CQM electrode is inapplicable.

ConMed Electrosurgery is not alone in this position. Some of the industry’s most respected organizations recognize the safety advantages and track record of return electrode CQM systems.

“ECRI strongly recommends the use of return electrode contact quality monitoring systems.”

- Operating Room Risk Management, January 1999

“Historically, the most frequently reported patient injury has been a skin injury (e.g., burn) at the dispersive electrode site.¹ The risk of this type of injury has been minimized through advances in dispersive pad design . . . and the use of return electrode contact quality monitoring².”

- AORN 2005 Standards, Recommended Practices, and Guidelines

Predictable Cost Per Procedure, Lower Than Reusable, Capacitive non-CQM Dispersive Electrodes

ConMed Electrosurgery considers dual dispersive CQM electrodes to be the most efficient balance of patient safety, cost, and risk reduction for hospitals and surgery centers.

Disposable, dual dispersive CQM electrodes provide hospitals and surgery centers with the most advanced safety mechanism available to reduce dispersive electrode site injuries at a predictable, low fixed cost.

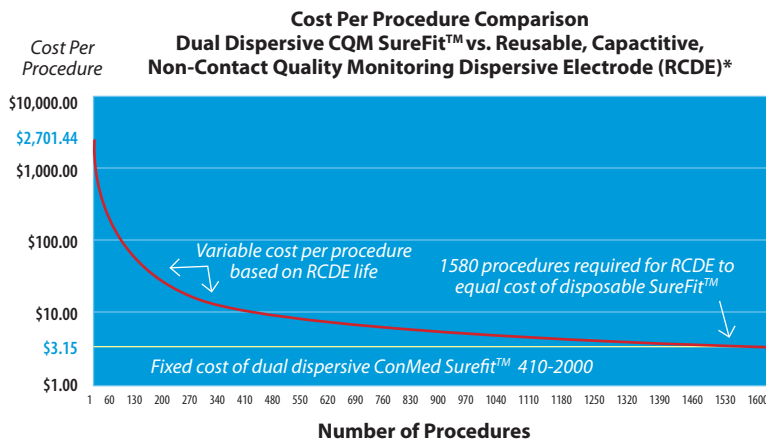
Reusable, capacitive, non-CQM dispersive electrodes do not allow for the measurement of the impedance, or the quality of the patient-pad interface. Additionally, these dispersive electrodes

¹ “Electrosurgery,” (Operating Room Risk Management) ECRI (January 1999) 7

² “Electrosurgical units,” Health Devices 27 (March 1998) 93-96

require an initial investment far greater than disposable dispersive electrodes. They also consume disposable accessories such as sheaths and drapes. These products require a high number of uses to be completed before the cost per procedure falls to the equivalent of a disposable, CQM dispersive electrode.

A hospital must use a reusable, capacitive, non-CQM dispersive electrode 1,580 times to equal the per use cost of a disposable CQM dispersive electrode. This is based on a price of \$2,700 for the reusable, capacitive, non-CQM dispersive electrode versus \$3.15 for the disposable CQM product.



* Reusable, capacitive, non-CQM dispersive electrode cost per procedure based on \$2,700 initial cost of electrode, \$0.38 per procedure for sheath (priced at \$1.50 each, used in four procedures and discarded), \$0.22 for linen, and \$0.83 for personnel to clean pad between procedures.

Should the reusable, capacitive, non-CQM dispersive electrode's life fall short of the number of procedures needed to reduce cost to disposable type product levels, cost per procedure can be significantly higher than disposable CQM dispersive electrodes. The table below provides a cost per procedure comparison.

Number of Procedures	SureFit™ Disposable CQM Electrode Cost Per Procedure	Reusable, Capacitive, Non CQM Electrode Cost Per Procedure*
5	\$3.15	\$541.44
20	\$3.15	\$136.44
50	\$3.15	\$55.44
100	\$3.15	\$28.44

*Cost of reusable, capacitive non-CQM electrode includes product, sheath, linen, and personnel costs to clean following procedures

Hospital Resources

SureFit™ single use, disposable CQM electrodes are discarded after each procedure and require no personnel resources to clean and inspect the devices following each use.

Reusable, capacitive non-CQM electrodes and their accessories should be inspected before each procedure for holes, tears, peeling, or damaged insulation. Hospitals must rely on their staff to accomplish this quality control step which can further burden hospital staff and increase costs.

Standardization

Some dual dispersive electrodes, such as ConMed's SureFit™ can be used for a wide variety of patient sizes and allow hospitals and surgery centers to standardize, further reducing costs. Reusable, capacitive non-CQM electrodes are often limited to use on patients over 25 pounds. Hospitals and surgery centers may need to carry additional dispersive electrodes for patients less than 25 pounds.

SureFit™ is indicated for all patients over 4.4 pounds and is more versatile than reusable, capacitive, non-CQM dispersive electrodes for standardizing to patient size.

Dispersive Electrode Patient Size Table		
Product	4.4 to 25 Lbs.	> 25 Lbs.
Disposable SureFit™ 410-2000 CQM electrode	X	X
Reusable, Capacitive, Non CQM electrode		X

Disposable, CQM Pads Are Designed for Patient Safety, Quality Control, and Cost Effectiveness

Call your local ConMed Electrosurgery Territory Manager or Customer Service at 1-800-438-3051 to arrange an evaluation of disposable CQM dispersive electrodes. These products are designed for patient safety, quality control, and cost effectiveness.

ConMed Electrosurgical Safety Courses That Further Explain CQM*

- The Pathway to Electrosurgical Patient Safety
- Bipolar Electrosurgery
- Argon Beam Coagulation: Patient Benefits and Safety
- Operating Room Fire Safety
- Surgical Smoke: Avoiding the Risks
- Gastroenterology Electrosurgery Patient Safety

* all courses listed offer CE credit

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