

Sports Medicine

Evidence Matters

Research Bulletin

Stryker CrossFire 2 console protects arthroscopes from damage due to arcing

Top-Level Summary:

Arcing, sudden increase in instantaneous current, between the RF probe and the distal end of the arthroscope (Fig 1) during RF ablation and coagulation causes damage to the scope tip which is detrimental to the visual clarity of the scope. (Fig 2) This study compared the ability of competitive RF generators to detect and terminate arcing. The Stryker Crossfire 2 Generator was found to detect and terminate arcing events better than competitive generators.¹

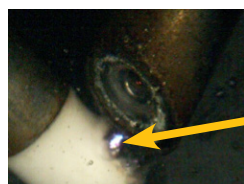


Fig. 1

Yellow arrow shows arcing between probe and arthroscope



Fig. 2

Left: Undamaged arthroscope
Right: Arthroscope which has been damaged by excessive arcing.

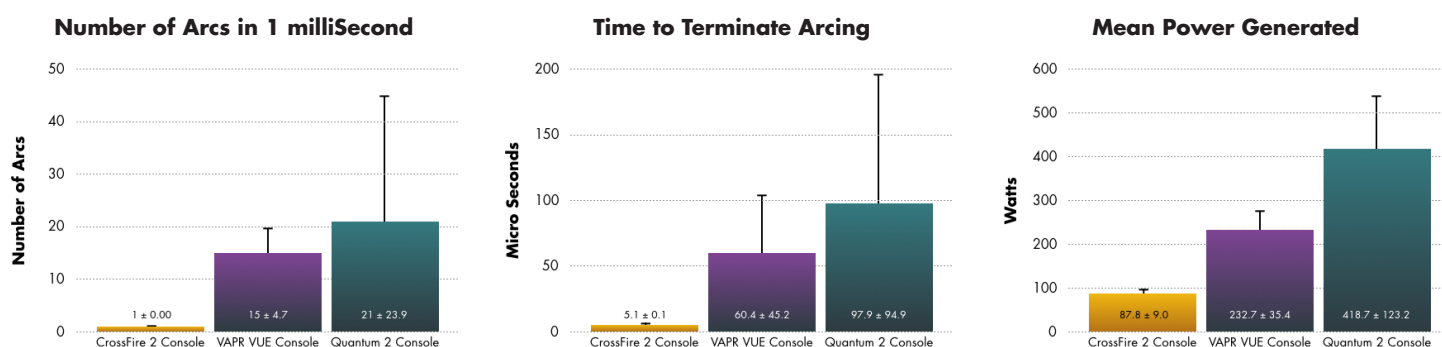
Methods:

Three RF systems were compared:

- Stryker CrossFire 2 console – SERFAS 90-S Cruise RF ablation probe
- DePuy Mitek VAPR VUE console – Premier 90 RF ablation probe
- ArthroCare Quantum 2 console – Super Turbovac 90 RF ablation probe

The test was conducted for four highest power levels for each of the RF generators. Five sample readings at each power level were recorded. The number of arcs occurring in 1 ms (millisecond), the time to detect and terminate the arc (in microseconds), and the average mean power (in watts) over 1 ms were recorded. Consoles with more arcing events will result in greater power detected.

Results:



[Values represent mean ± standard deviation]

The CrossFire 2 console had significantly fewer arcs in 1 ms, took significantly less time to terminate arcing, and generated significantly less power than both the VAPR VUE and the Quantum 2 consoles. The CrossFire2 console generated a single arc in an interval of 1 ms on every single test. All arcs were detected and terminated by the arc detection software after each occurrence. The ArthroCare Quantum 2 and Mitek VAPR VUE consoles generated 21 and 15 arcs respectively in a 1 ms interval. While the two competitive consoles can detect the short circuit, they do not comprehensively detect and terminate the arcs generated.

Clinical Relevance:

While the CrossFire 2 console detects arcing after a single event, both the VAPR VUE and Quantum 2 consoles continue to allow multiple arcing events to occur for a longer time span before terminating the arc. **The CrossFire 2 console has been shown to detect arcing and limit the current overshoot to protect arthroscopes from damage during RF ablation and coagulation.**

References:

1. Stryker Technical Report TR16786, February 2017.

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