

## Evaluation of the Use of a Force-Activated Separation Device (SafeBreak® Vascular) for Protection Against Intravenous Catheter Disruption in Large Animal Patients

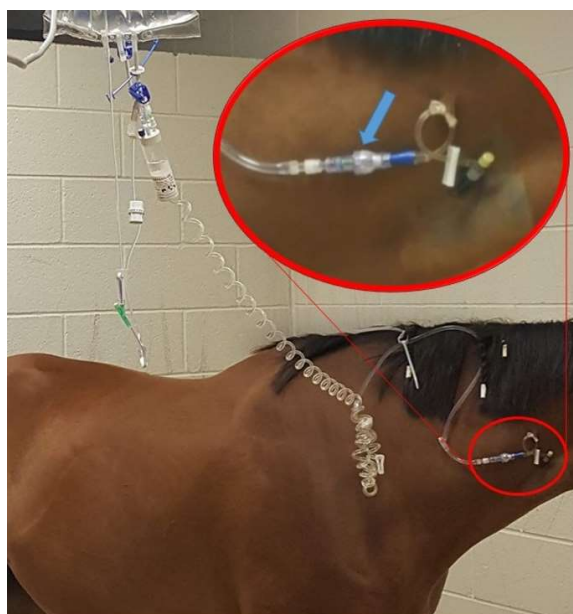
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### Background

Accidental IV line disruption can cause the dislodgment of the catheter or disconnection of the IV line from another tubing component. In both cases, the result is loss of efficacy of the treatment as well as the eventual clotting of the IV catheter due to blood regurgitating into the line. These IV line disruptions require replacement of the IV catheter, which increases patient discomfort, may require additional use of sedative drugs, and increases the overall cost of the treatment for the client. Protection of fragile IV catheters with a Force-Activated Separation Device (FASD) could be beneficial for both the patient and the client. The aim of this study was to prospectively evaluate the use of a FASD, SafeBreak Vascular, and record the disruption rate of the FASD when used on large animal clinical patients. Earlier studies showed that the force required to create intravenous catheter line failure in a simulated, large animal jugular vein model (7.6 lbs) was approximately 80% greater than the separation force of SafeBreak (4.2 lbs).<sup>1</sup> This suggested that the use of SafeBreak on large animal patients could provide effective protection of IV lines in a clinical setting.

### Methods

All patients with an indwelling intravenous catheter admitted to the large animal ICU between September 2018 and March 2019, were enrolled in the study. An extension set was secured to the intravenous catheter of all enrolled patients per hospital practice. SafeBreak was installed between the extension set and the IV fluid line for each patient enrolled in the study. Figure 1 shows a representative patient with SafeBreak placed in the IV line.



*Figure 1 – Representative Large Animal Patient with  
SafeBreak Installed in the IVC*

All patients were monitored every six hours for evidence of SafeBreak separation. All separated devices were noted with the most likely reason for separation recorded. All separated SafeBreaks were replaced with another device as long as the patient was hospitalized with an intravenous

catheter. All complications associated with SafeBreak were also recorded.

Intravenous catheters were replaced in animals who developed complications with their IV catheters (IVC) but still required an IVC for continued care in the ICU. All complications associated with the IVCs were also noted.

## Results

Twenty-nine large animal patients were enrolled in the study, representing an identical number of IVCs placed (17 left jugular veins, 10 right jugular veins, one saphenous vein, and one ear vein). A vast variety of large animal species were represented (8 goats, 7 cattle, 5 llamas, 5 sheep, 2 pigs, 1 horse, and 1 alpaca). There was separation of SafeBreak in 24% of the animals (7 of 29) with a total of 10 events, while 76% of animals (22 of 29) had the SafeBreak device remain intact throughout the duration of the fluid administration during their hospitalization.

Reasons for separation of SafeBreak are outlined in Table 1. After device separation, all animals but one had the device replaced. There was one IVC related complication in the study. One pig, on which an ear catheter was placed, was found with the IVC dislodged from the vein despite the fact

that SafeBreak had separated. The chronology of the events is unclear, but the hypothesis is that the device separated to protect the catheter before the animal rubbed the IVC out of its ear. This appears to be the most plausible series of events to the investigators, although the root cause remains unknown. There were no additional IVC related complications noted for animals that experienced a SafeBreak separation. Additionally, no complications associated with SafeBreak were noticed during the study period.

## Discussion

This study suggests that hospitalized large animals with an IVC appear to tolerate the addition of SafeBreak into the IVC. The certified veterinary technicians found the device easy to use and use of the device did not appear to cause any interruptions in the care provided. In addition, SafeBreak appeared to prevent bleeding from the catheter site after device separation. While there was one pig whose IVC was dislodged from the ear vein despite the separation of the device, it appears that SafeBreak provided a protective effect on the lifespan of the IVC in hospitalized veterinary patients as evidenced by the fact that most of the devices that separated happened in active large animals ambulating in their pens. It is likely that all those catheters

**Table 1: SafeBreak Separation Events Summary**

Cause for Device Separation	Occurrence (N=10)
Patient pulled on line	7
Line obstruction and separation by manipulator	1
Separation during rolling of the patient	1
No cause identified	1

would have suffered a complication such as mechanical dislodgement if SafeBreak were not in place, leading to additional pain, stress, and costs for IVC replacement in those patients. However, a control group of patients without the SafeBreak device attached to their IVC is required to be able to fully outline the efficacy of the SafeBreak device in large animal patients.

### Conclusion

While the sample size was not large enough to achieve statistical significance, it appears that the SafeBreak device reduced IV catheter complications in hospitalized large animals. Further study to evaluate and compare against a control group of large animals without SafeBreak would be necessary for a more definitive conclusion.

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<sup>1</sup> Mulon, P., et al., Evaluation of the Use of a Break-Away Device (SafeBreak) for Protection against Intravenous Catheter Disruption in Small and Large Animal Patients. AVA Poster, 2018.

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Please see the package insert for the complete list of indications, warnings, precautions, and other important medical information.