

**Purpose:** In a recent ABS survey, over 90% of those surveyed used a single channel vaginal cylinder for endometrial cancer brachytherapy. Here, we establish the clinical and dosimetric advantage of using the Mammosite™ balloon in an intravaginal delivery of radiation to the vaginal apex as compared to a standard cylinder. We have called the use of the balloon in this manner “GynSite®.”

**Method and Materials:** Twenty patient treatments were analyzed for each delivery method. Each patient was imaged either with CT or MR with the device in place. Using Brachyvision v8.2, the prescription dose was optimized to the surface of each device. The Dose Homogeneity Index (DHI) and the FWHM of the differential DVH were analyzed for each delivery. The dose to the 1 mm vaginal lymphatic channel was determined and the  $V_{100}$  and  $V_{150}$  reported.

**Results:** The GynSite® delivers a dose distribution similar to that of the standard cylinder. However, it allows more patient-specific delivery of the radiation to the vaginal apex because of the flexibility and variable size of the balloon. Cylinders only come in discrete sizes (diameter of 2.0, 2.5 cm, etc.) whereas the balloon has variable shapes (spherical or elliptical) and fill volumes (35cc – 125cc). This flexibility allows the device to better conform to the patient’s anatomy thus reducing air gaps between the applicator and the target vaginal mucosa at 1mm depth. Additionally, it is more comfortable for the patient because it is inserted and removed in a deflated state. The DHI and FWHM were similar between the cylinder and the GynSite® deliveries.

**Conclusion:** The GynSite® is clinically superior to a standard cylinder since it conforms better to the patient’s anatomy and therefore delivers a better dose to the lymphatic channel and possibly improves tumor control.