

AbstractID: 4479 Title: Analysis of Couch Sag and couch deflection in several EXACT Couches

**Purpose:**

To measure couch sag and couch deflection in several EXACT Couches.

**Method and Materials:**

Couch sag was evaluated for EXACT Couches at three positions: tip, center and base with the couch fully extended in treatment position. In each case, measurements were made with no weight and with 84, 142, and 319 lbs uniformly distributed over the couch surface. Couch deflection was evaluated with SSD readings to the couch surface using the mechanical backpointer at isocenter and digital read out. Measurements were repeated with the couch at nominal SSDs of 100 cm, 110 cm and 120 cm and with rails closed together in the middle. Same measurements were performed with Picker CT couch for comparison.

**Results:**

We found 9 mm deflection from the tip to the base of couch (fully extended) with no weight on the surface. According to Varian service personnel, design of EXACT Couches follows IEC specification and Exact Couch manufacturers provided a +5mm deflection to counter weight the patient's weight. Our couch was shimmed and brought the sag down to +5mm. EXACT Couch deflection with no weight on surface varied between 5-9mm at five different centers. Sag was same at nominal SSDs. Up to 7mm sag variation was noticed depending upon the weight.

With rails closed together in the middle, about 1mm decrease was noted for the above values. Up to 4mm sag was noticed in CT couch. Unlike Exact couch, CT couch sag decreased at the base.

**Conclusions:**

Study demonstrated that the +5mm deflection does not completely counter weight the patient's weight for having leveled surface at the isocenter. 2-5mm sag at tip and up to -7mm at base relative to the amount of weight on couch was noticed. In time +5mm-shimmed deflection was deteriorated to +7mm. Same results were obtained when couch was loaded.