Purpose or Objective: Conventionally in radiotherapy, a large beam forming apparatus is rotated around a stationary patient in order to achieve multiple beam angles. However, for a number of emerging and existing treatment modalities such as proton therapy, heavy ion therapy, MRI guided therapy, and synchrotron based therapies, such an approach results in prohibitively expensive and complex treatment systems. At the same time, much of the world has no access whatsoever to even conventional radiation therapy treatments. Replacing the gantry rotation with patient rotation could lead to much simpler and more cost effective treatment units. However, it is often assumed that patient acceptance would be a major barrier to widespread use of such a system. The purpose of this work was to test this assumption by investigating patient tolerance to slow single arc rotation.

Material and Methods: The Epley Omniax (Figure 1) is a clinically approved medical device conventionally used in balance disorder therapy, and can rotate 360 degrees around any of its three axes. We used this device to test patient tolerance to slow, single arc rotation. Each patient underwent slow, single arc rotation in two orientations; sitting and lying. Patients were rotated a full 360 degrees in increments of 45 degrees. The rotation was paused for 30 seconds at each 45 degree increment to simulate beam delivery; in total this simulates the delivery of 8 beams. Patients were rotated in both an upright (sitting) and lying position in the same session. Response was monitored via validated psychometric questionnaires for claustrophobia, anxiety, and motion sickness. Thus far, 10 of a planned 15 current or former cancer patients have been recruited.

Results: Patient tolerance has been high - 9 out of 10 have completed the study without incident, and in general patient feedback has been positive. One patient was unable to complete the lying rotation, but was still able to complete the sitting rotation without issue. No detectible differences in anxiety or motion sickness have been observed from either sitting or lying rotation. A summary of the patient cohort and results thus far is outlined in table 1. Accrual for this study is ongoing.