Purpose: To analyze the clinical impact of esophageal sparing on treatment plans for patients with grade 3 esophagitis.

Methods: The treatment plans of 8 patients (project total: 20 patients) who were treated with IMRT and exhibited stage 3 esophagitis were re-planned to give a simulated clinical plan with dose distribution that mirrored our current clinical practice (74Gy to the target, and 5mm margins), and a plan that emphasized esophageal sparing. Doses to the esophagus, heart, cord, lung and PTV were compared.

Results: Comparing the esophageal sparing plan to the simulated clinical plan, the mean reduction in esophageal volume receiving 50, 55, 60, 65, and 70Gy were 2.0, 3.2, 5.0, 7.2, and 10.9 cm³, respectively. The mean reduction in the continuous length of esophagus receiving 50, 55, 60, 65, and 70Gy were 12, 24, 38, 40, and 47mm, respectively. The associated reduction in dose to 90% and 95% of the PTV was 2.2 and 3.8Gy, respectively. Of the 8 patients examined, 2 showed a significant decrease in PTV coverage (4.6Gy, 12.3Gy for 90% of PTV), 4 showed decreases under 1.1Gy, but 2 showed an increase of 1.4Gy and 0.5Gy for 90% PTV. Cord dose was maintained below 50Gy, and there was a slight increase in mean heart dose and mean lung dose of 2.4Gy, and 2.7Gy, respectively. Data will also be presented comparing these plans with the actual treated plans (for which the patients had grade 3 esophagitis) and plans that emphasize PTV coverage.

Conclusions: Treatment planning to emphasize esophageal sparing can reduce the volume and continuous length of the esophagus which receives high doses. There is some associated modest reduction in PTV coverage. In summary, in many cases esophageal sparing can be accomplished for lung cancer cases while maintaining adequate PTV coverage, although there is variability between patients.