Pantalar arthrodesis (PTA) is a salvage procedure used to address complicated, limb threatening foot pathology. It has been popularized to treat deformities associated with posterior tibial tendon dysfunction (PTTD), Charcot, neuromuscular disorders, and post-traumatic arthritis. The purpose of this study is to evaluate the fusion rate of the talonavicular joint (TNJ) following PTA. To our knowledge it is the first study to report this data. A secondary aim of this study is to evaluate demographics, pathology or fixation constructs that may correlate with successful fusion and if radiographic fusion plays a role in those who are clinically symptomatic post-operatively.

Level of Evidence: 3
Financial Disclosures: None

Methodology and Procedure
56 patients who underwent PTA were retrospectively reviewed for fusion at the TNJ. All patients underwent surgery by a single surgeon between 2010 and 2018. A minimum of 12 months follow-up was required. Etiologies included post-traumatic arthritis, PTTD, Charcot and neuromuscular disorders. Serial postoperative radiographs were evaluated by the investigators to determine TNJ fusion as defined by bony consolidation so that joint lines were no longer visible on two or more views. Fixation type, time to fusion, symptomatic vs asymptomatic, and basic demographics were evaluated. Those who went on to below knee amputation were excluded from remaining analysis.

Results
Of the 56 PTAs performed, 18 (32%) went on to fusion at TNJ. Mean time to fusion was 149 days with a median 101 days. There was no statistical significance in any demographics between fusion and nonunion groups.

The most common reason for PTA was Charcot (n=31) followed by neuromuscular disorders (n=17). PTTD (n=6) and post-traumatic arthritis (n=4). With respect to reason for surgery, there was no statistical significance between union groups. There was no difference in fusion rate with type of fixation utilized. 66% of fixation constructs utilized a combination of screws and a plate.

Following PTA, all seven total patients were symptomatic at the TNJ. Two of these did achieve radiographic TNJ fusion while five did not. Those who either used tobacco at the time of surgery or had a history of tobacco use had 8.5 times the odds of being symptomatic as those who had never used tobacco, which trended towards statistical significance.

Analysis and Discussion
68% of TNJ fusions during PTA resulted in nonunion based off of post-operative radiographs. Considerations for such high nonunion rates could include the inherent structural complexity of the joint and the tenuous blood supply to the joint that, compromised, may inhibit osseous union. This could account for our high rate of symptomatic patients with tobacco use history. 85% of patients who did not fuse were asymptomatic at final follow-up. Only 5 patients were both symptomatic and had a nonunion while the remaining 2 did fuse but were symptomatic. This begs the question, does fusion of the TNJ need to be performed at all?

References