# S2 Text. Localizations.

To further stratify patients by the degree of localization of their active joints, we conducted a bootstrap analysis. In this analysis, we calculated a threshold based on the proportions of active joints that are also key joints in high-level factors underlying patient group assignments. For example, if , a patient with only knee arthritis would have 100% of their active joints appearing in **<F knees>** and therefore would be *localized* with respect to **<F>** (see Results). We considered patients with as having *localized* involvement. The number of such patients is . We chose the highest threshold that satisfied

where is the bootstrap mean and is the standard error of the mean.

We defined an additional category, *partially localized* involvement, by determining which threshold had the lowest slope as calculated by . We classified patients with as having *extended* involvement, involvement of joints beyond those defining their underlying high-level factors.