Serum albumin is a leading index of protein-energy malnutrition (PEM) that has been associated with mortality among hemodialysis patients. Studies have found that albumin levels at the start of dialysis and the slope of albumin over time are independent risk factors for mortality. It is also natural to hypothesize that high within-subject variability in albumin measured over time may also be indicative of increased mortality. That is, high instability around a patient's first-order trend is likely an indication of nutritional instability and hence may be a risk factor for morbidity and mortality. We develop a Gaussian process model for estimating a summary measure of within-subject volatility in serum albumin measured over time. The proposed model includes a parameter to allow for subject-to-subject variability and places a Dirichlet process prior on the unknown distribution from which these subject-specific parameters are drawn in order to cluster subjects with similar longitudinal patterns without specifying the number of clusters. Simulation studies that assess the proposed model are presented and an illustrative example is provided where the induced summary measure of within-subject volatility is associated with mortality using patients from the United States Renal Data System.

This work is joint with Dr. Tracy Holsclaw and Professor Babak Shahbaba.