

### **Preliminary Analysis for Development of AI to Identify Hospitalized Patients for Whom Nourishment Will Provide Benefit**

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**Objectives:** A diagnosis of malnutrition is strongly associated with poorer hospital outcomes. However, no current definition of malnutrition identifies, with adequate sensitivity, patients who will respond to nutrition interventions. This retrospective cohort study is preparatory to development of machine learning artificial intelligence (AI), applied to a large study population, to find characteristics that will better identify patients who are likely to respond to nutrition support (i.e., those truly malnourished).

**Methods:** Electronic medical record (EMR) data for all hospital inpatients admitted at Columbia University Irving Medical Center between January 1, 2016 to February 1, 2020 was extracted from the

clinical data warehouse. Those diagnosed with malnutrition, based on dietitians' nutrition diagnosis notes, were identified. Data analyzed for this study were time to diagnosis (TTD) of malnutrition (i.e., time from admission until diagnosis note entered), hospital length-of-stay (LOS), and discharge disposition (e.g., home, nursing facility, hospice, or in-hospital mortality), as recorded in the EMR.

**Results:** Data were extracted for 299,689 patients. A total of 24,944 patients were diagnosed with malnutrition. There was significant correlation between TTD and LOS (correlation coefficient 0.549;  $P < 0.001$ ). Using a machine learning predictive model, there was a weak correlation between TTD and discharge disposition.

**Conclusions:** This analysis is an initial step in our development of a novel algorithm to predict response to nutrition intervention, using machine learning AI in a large cohort. We have demonstrated our ability to extract and analyze data from the cohort. Next steps will include further analyses and development of algorithms, toward development of models to predict response to nutritional interventions in hospital inpatients.

**Funding Sources:** None.