# **The association between calorie intake and Functional Independence Measurement Scores in Adult stroke Patients**

# Business Proposal

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# EXECUTIVE SUMMARY

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Malnutrition, based on biochemical and anthropometric parameters as well as subjective global assessment (SGA) has been shown to be prevalent (50%) in the stroke population1-2. Limited intake is likely associated with the side effects that occur after stroke such as dysphagia, depression, and poor self-feeding3. The literature also suggests that poor nutrition may be adversely affecting functional independence measurement (FIM) scores in stroke survivors1, which reflect poor functional outcomes. The original purpose of this quality improvement project was to determine the relationship between calorie consumption and FIM scores based on an intensive nutritional intervention versus standard care among adult stroke patients admitted to acute rehabilitation specifically using calorie counts to assess nutrient intake. Due to poor documentation by the nursing staff, an observational approach was taken using percent meal consumption data obtained from the electronic medial record. We hypothesize that higher calorie consumption will correlate with higher FIM scores and therefore better patient outcomes. It is recommended that future research (randomized control trial) is needed on this proposed concept to provide strong evidence that nutrition is truly playing a role in a patient’s functional outcomes specifically after stroke.

1. Davalos A, Ricart W, Gonzalez-Huix F, et al. Effect of malnutrition after acute stroke on clinical outcome. *Stroke*. 1996;27(6):1028-1032.

2. Finestone HM, Greene-Finestone LS, Wilson ES, Teasell RW. Malnutrition in stroke patients on the rehabilitation service and at follow-up: Prevalence and predictors. *Arch Phys Med Rehabil*. 1995;76(4):310-316.

3. Rabadi MH, Coar PL, Lukin M, Lesser M, Blass JP. Intensive nutritional supplements can improve outcomes in stroke rehabilitation. *Neurology*. 2008;71(23):1856-1861.

# Description of Project

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## Data Collection and Analysis

Data was collected from January 5th, 2016 until March 4th, 2016. All data were obtained from the electronic medical record and included gender, age, length of stay (LOS), weight upon admission, weight upon discharge, type of stroke, diet order, estimated nutrition requirements, subjective global assessment (SGA) components, occupational therapy (OT) average admission and discharge FIM scores, physical therapy (PT) average admission and discharge FIM scores, combined average OT/PT admission and discharge FIM scores and energy (kcal) intake. Percent meal consumption data documented by nursing was put into foodservice software (CBORD) to obtain calorie content for each meal. For missing meal consumption data, the previous meal was used. Daily intake was calculated by adding the calories consumed at breakfast, lunch, and dinner. Descriptive statistics were used to analyze demographic variables and average daily intake. Mixed effects regression models were used to determine the association between daily calorie consumption and change in FIM scores.

## Outcomes

The subject population (n=29) was 62% (18) male with an average age of 64.8 years. The average LOS was 11.4 days. The average daily calorie intake was 1640 calories per day. It was found that daily calorie intake significantly influenced FIM scores. For every 1000 calories consumed per day, OT FIM scores increased by 0.56 (p=0.005), PT FIM scores increased by 0.84 (p=0.001), and combined OT/PT FIM scores increased by 0.72 (p=0.001).

## Conclusions/Importance/Recommendations

In conclusion, our longitudinal data analysis suggests that calorie intake may have a positive effect on FIM scores. Our evidence is not strong enough to suggest a causal effect given the nature of the study design, the small sample size, and the inaccuracy of the calorie intake using CBORD. Thus, we recommend the following:

* Nutrition interventions for stroke patients should focus on increasing calorie intake
* Further research on determining if provision of oral supplements, high calorie/high protein snacks, or encouraging enteral nutrition can improve FIM scores.
* Continued training and encouragement of proper calorie count documentation to nursing staff for more accurate data collection