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# Modified Frailty Index as a Predictor of Mortality in Intracerebral Hemorrhage

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## Learning Objectives

To demonstrate that a patient's pre-hemorrhage state can influence their outcomes from an intracerebral hemorrhage

## Introduction

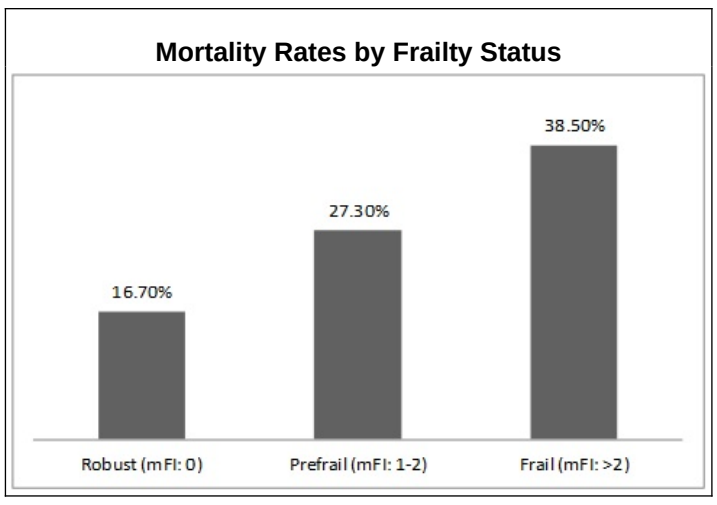
Intracerebral hemorrhages (ICH) carry the highest rates of morbidity and mortality of the stroke subtypes despite advances in medical and surgical care. Many current grading scales such as the ICH score and FUNC score only take into account factors such as size of hemorrhage, neurologic exam, and age. These scales do not consider the patient's pre-hemorrhage medical comorbidities. One model of frailty suggests that there is decreased reserve in multiple organ systems due to accumulating deficits. The modified frailty index (mFI) consists of 11 items and has been validated in prior studies. The mFI has been shown in multiple surgical subspecialties to correlate with increased morbidity and mortality. This study aims to analyze whether there is a similar correlation between mFI and ICH mortality rates.

## Methods

We performed a retrospective chart review of all patients admitted to the neurosurgical service with intracerebral hemorrhage between September 2015 and September 2017. The electronic medical records were analyzed to identify mFI components, in-hospital mortality rates, and other standard ICH variables (e.g. hematoma size, neurologic outcomes, etc.).

## Modified Frailty Index

- History of diabetes mellitus
- Overall functional status requiring some or total assistance with ADLs
- History of COPD or pneumonia
- History of congestive heart failure
- History of myocardial infarction
- History of percutaneous coronary intervention, cardiac surgery, or angina
- History of hypertension requiring medication
- History of peripheral vascular disease or rest pain
- Impaired sensorium
- History of either transient ischemic attack or cerebrovascular accident with no deficits
- History of cerebrovascular accident with neurologic deficit




## Results

Our preliminary data on 54 of the 209 overall patients shows that increasing frailty is associated with worse morbidity and mortality. 11.1% (6/54) had an mFI of 0, 18.5% (10/54) an mFI of 1, 22.2% (12/54) an mFI of 2, 20.3% (11/54) an MFI of 3, 22.2% (12/54) an mFI of 4, and 5.6% (3/54) an mFI of 5. When grouped into robust (mFI of 0), pre-frail (mFI 1-2), and frail (mFI >2), there was an association with increasing mortality rates. There was a mortality rate of 16.7% (1/6) in robust patients, 27.3% (6/22) in prefrail patients, and 38.5% in frail patients (10/26).

## Conclusions

There are numerous scoring systems that predict morbidity and mortality after spontaneous intracerebral hemorrhages (e.g. FUNC, ICH score, etc.). However, these scoring schemas typically are influenced principally by the hemorrhage size and the patient's presenting neurologic exam. They do not factor in the patient's frailty or underlying medical comorbidities. The mFI adds another element that is useful in counseling spontaneous ICH patients by predicting their mortality rates based on their medical history.

## References

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