Letter to Editor: Does the "Hospital Frailty Risk Score" Measure Frailty in Patients Undergoing Surgery for Primary Spinal Cord Tumors?

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We read with great interest the article by Elsamadicy et al.[1] "Hospital Frailty Risk Score and Healthcare Resource Utilization After Surgery for Primary Spinal Intradural/Cord Tumors" recently published in the January 2022 issue of Global Spine Journal. The study used the Hospital Frailty Risk Score (HFRS) to assess the impact of frailty on patients undergoing surgery for primary tumors of the spinal cord and meninges, using cases extracted from the Nationwide Inpatient Sample (NIS) database. Based on the HFRS, patients were dichotomized into: Non-Frail (HFRS <5) and Frail (HFRS ≥5), with 21.2% patients classified as Frail.[1] The authors concluded that Frail patients were associated with increased postoperative complications, hospital costs, non-routine discharge, and prolonged length of stay LOS.[1] Therefore, they proposed the use of the HFRS as a novel neurosurgical frailty index for patients undergoing surgery for primary spinal cord tumors. We appreciate the authors' efforts in exploring neurosurgical outcome research; however, we are seeking clarification regarding the use of the HFRS in this study.

The original HFRS paper published by Gilbert et al.[2] developed the index using >1000 ICD-10-CM codes over-represented in older hospitalized adults (≥75 years of age), who had diagnoses associated with what they termed "frailty". However, the authors only validated the HFRS for older patients ≥75 years old and also presenting in the acute care setting. Therefore, how are the authors applying this scoring system to a much younger patient population of ≥18 years of age? Have they validated the HFRS for all adult patients? Furthermore, with respect to the statistical methodology, the calculated c-statistics, model discrimination, for 30-day mortality, prolonged hospital LOS and 30-day readmission were .60, .68 and .56 respectively, which was below the normal acceptable epidemiological threshold.[2]

Another issue arises when using the HFRS with cross-sectional administrative billing databases, such as the NIS. In the NIS patients are assigned ICD-10-CM codes at discharge, without clear specification of whether a condition occurred pre-operatively or post-operatively.[3] Therefore, such temporal fallacy would cause frailty points to be calculated for postoperative complications and deficits. Finally, a large percentage of the highest scoring HFRS variables likely measures acute pathological conditions and/or their severity (eg "abnormalities of gait and mobility", "Somnolence, stupor, and coma" or "acute renal failure") as opposed to a baseline assessment of a physiologic reserve.[2] For example, a young patient with a primary spinal cord tumor, even a benign tumor, causing extremity weakness, sensory changes, gait instability, any type of falls or acute urinary incontinence would be classified as "frail", despite having no physical limitations or chronic health condition prior to the acute presentation. This is not how frailty is used in the literature for surgical outcome prediction. How do the authors account for these critical factors?

Finally, we encourage caution with a thorough and rapid revision to the use of the HFRS in this context as multiple neurosurgical reports have rapidly emerged with a similar structure and statistical irregularity.[4-8] Given the present concerns, what is the utility of the HFRS within clinical

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neurosurgery and how do the authors feel they would modify their conclusions based on the presenting evidence?

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