



ARTICLE OF THE MONTH

Home-based Cognitive Prehabilitation in Older Surgical Patients: A Feasibility Study

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We welcome you to the June 2019 installment of SNACC's Article of the Month. This month's selection addresses pre-operative cognitive prehabilitation.

The article was selected and commented on by Dr. Amie Hoefnagel. Dr. Hoefnagel is an assistant professor of anesthesiology at the University of Florida. In addition to her love of teaching residents and other medical trainees the intricacies of neuroanesthesia, she has many administrative roles including serving as the associate chair for clinical operations and the director of quality improvement in her department. She has been actively involved with SNACC for the past eight years.

As always, readers are welcome to join us for further discussion on the [Twitter](#) feed or on [Facebook](#).

~ Nina Schloemer Kemper, MD, Adrian Pichurko, MD, and Oana Maties, MD

Commentary

Amie Hoefnagel, MD

During a recent trip to St. Augustine, Florida, I visited the fabled "Ponce de Leon Fountain of Youth." As the story goes, the fountain is a spring and anyone who drinks or bathes in its waters will be restored to their youth. De Leon explored St. Augustine, Florida in 1513, where he found a spring welling up from the rocks and declared that he had found the fountain of youth. For as long as history has been recorded, we have been searching for ways to stave off the effects of aging.

An editorial in *Anesthesiology* in 2012, by Rooke *et al*, cited United States Census data, stating that by the year 2050, there are expected to be 31 million US citizens over the age of 80. Worldwide, the WHO estimates that by this same year there will be 2 billion people over the age of 60, compared to 900 million in 2015. In fact, it is expected that by 2050 there will be more persons aged 60 and older than children under the age of five. To put this in perspective, the majority of next year's graduating anesthesia residents will be aged 60 in 2050. With the expected expansion of the elderly patient population, now is the time to start preparing to meet the unique challenges of providing anesthesia to older patients.

Postoperative delirium (POD) is just one of the many possible complications that older patients face after a surgery and anesthetic. Estimates of the incidence of POD range widely from 10%-70% in this age range. A diagnosis of POD carries significant morbidity, can increase mortality, lead to longer hospital stays, need for skilled nursing interventions and worsening cognitive decline, all of which increase healthcare spending. Vlisides *et al*, present a study where they attempted to mitigate POD by having patient undergo at home cognitive pre-habilitation prior to surgical intervention.

The authors enrolled 61 patients who were scheduled to undergo non-cardiac, non-vascular, and non-intracranial surgery and then single blinded participants to either undergo preoperative cognitive training or to have no training in the preoperative period. The primary outcome was an incidence of POD at any time starting in PACU until postoperative day three, as assessed with the 3D-Confusion Assessment Method. Secondary outcomes included multiple assessments of cognitive function, hospital length of stay, and proportion of physical therapy session successfully completed. The authors did not find a statistically significant difference in the rate of POD between the groups. Nor did any of the secondary outcomes meet statistical significance.

It is notable that of 29 patients who randomized to be in the pre-training group only five completed the prescribed seven days of training. The training itself was an adaptive computer-based program that focused on executive function, attention, working memory and visuospatial processing by completing a series of games each day. Training was to last for seven days, with each session taking ~20 minutes. Despite the seemingly small time commitment, there was still a large dropout rate, mostly due to feelings of anxiety, being overwhelmed or experiencing computer problems (thereby having no access to the training).

In summary, postoperative delirium is a prevalent problem, especially in older patients undergoing surgery. This feasibility study found that patients were unlikely to complete unsupervised home-based preoperative cognitive training. They recommend that in future studies patient undergo prehabilitation over a longer timeframe, with supervision and feedback. In the interim, if you find yourself in northern Florida, I highly recommend spending a day in St. Augustine and taking a sip from the Fountain of Youth.

References

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2. WHO (World Health Organization). Ageing and health. <http://www.who.int/mediacentre/factsheets/fs404/en/> (2019)
3. Vlisides PE, Das AR, Thompson AM, Kunkler B, Zierau M, Cantley MJ, McKinney AM, Giordani B. Home-based Cognitive Prehabilitation in Older Surgical Patients" A Feasibility Study. *J Neurosurg Anesthesiol* 2019; 31:212-17.
4. <https://www.fountainofyouthflorida.com/visit/> (2019)